

**The Exploration, Ideation, and Design
of Athlete Retirement Prototypes for the Canadian High-Performance Sport System**

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Abstract

High-performance athletes' (HPAs) engagement in proactive retirement preparation has become increasingly important for their well-being and quality of life during and after sport. As researchers continue to highlight the plethora of challenges underprepared HPAs face when retiring from sport, retirement support available to Canadian HPAs through Game Plan continues to be significantly underutilized (Game Plan, 2023). Researchers have identified environmental barriers as an influencing factor determining athletes' ability to access and utilize available forms of retirement support (Brassard et al., 2022). Current literature lacks the use of a holistic lens to identify the organizational factors that act as barriers and facilitators faced by athletes in this regard. An exploration with this lens could enhance our understanding of HPAs' ability to prepare for retirement by providing insights into the organizational interplay sport members have in facilitating a sport environment that enables, restricts, or hinders a HPA's ability to prepare for life after sport. Furthermore, a holistic lens can provide researchers with the necessary information to develop further frameworks and strategies to minimize athlete retirement barriers (Stambulova et al., 2020).

The purpose of this doctoral dissertation is to address this gap through the following objectives: (a) examine how active and retired athletes utilized retirement support mechanisms, (b) explore high-performance sport members' perspectives and understanding of retirement support mechanisms, and (c) facilitate co-design sessions to innovate solution-driven prototypes to address sport members' athlete retirement needs. The methodologies of Bronfenbrenner's Ecological Systems theory and Design Thinking were adopted to guide and facilitate this research. This dissertation is composed of three articles, each correlating with the research objectives.

With the first research objective, a secondary data analysis was used to examine how athletes in the Canadian sport system were utilizing Game Plan's resources from 2019-2021. This examination provided insight into athletes' Game Plan usage discrepancies when drawing comparisons to the funding each National Sport Organization (NSO) earned, their league of competition (e.g., Para or Non-Para sport), and repeat uses of Game Plan's resources after an initial interaction. As a result of the findings from this examination, considerations are proposed for sport organizations who seek to improve their athlete engagement with Game Plan's retirement resources.

The second objective was investigated through empathy interviews (Kelley & Kelley, 2013) conducted with active athletes, retired athletes, support personnel, and performance partners across the sport system. A total of 19 individuals were interviewed. Empathy interviews were used to create personas for each role. Findings from this exploration add to the literature by outlining the following empirical findings: (a) high-performance sport members have limited knowledge and understanding of accessible retirement resources, (b) sport organizations' cultures can present barriers or facilitators through direct and indirect messages to athletes, and (c) HPAs who proactively sought out support or had a good sport-life balance experienced fewer challenges adapting to life after sport.

The third and final objective was supported via the Stanford d. school's five-step Design Thinking model: empathize, define, ideate, prototype, and test. This section of research consisted of a co-design session conducted with two groups of participants. In each session, participants were led through brainstorming cluster activities to define, ideate, design, and evaluate athlete retirement solution-driven prototypes. Sport members collaboratively designed the following three evidenced-based prototypes: (a) creating a new funding metrics system, (b) strengthening

collaboration between NSOs and Game Plan, and (c) enhancing athlete retirement coach education. The Design Thinking process as well as the insights outlining why and how the adoption of each prototype can advance HPAs' ability to prepare for their lives after sport are discussed. This article is the first to adopt a Design Thinking approach to advance athlete retirement literature and aims to serve as a catalyst for researchers to adopt Design Thinking methods to further the field of sport performance psychology. The results of this doctoral dissertation research add empirical, theoretical, and methodological contributions to both the athlete retirement and Design Thinking literature.

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Introduction

Preparing and supporting high-performance athletes (HPAs) for their retirement out of sport has been an ongoing challenge researchers and practitioners have grappled with for several decades (Jewett et al., 2019; Lally, 2007; Werthner & Orlick, 1986). Sport participation promotes a plethora of physical, emotional, physiological, social, and mental health benefits (Park et al., 2013); however, while these benefits can improve one's quality of life and athletic career, one's departure from sport may pose considerable counter effects.

Accordingly, the concept of athlete retirement has received extensive theoretical research to provide insight into HPAs' experiences and to outline what factors help or hinder their transition experience. However, the current theoretical literature is limited, especially from the perspectives of other characters (i.e., non-athletes) in the sport system (Clemmet, 2012). Therefore, present-day understanding of athlete retirement remains skewed from the perspective of HPAs, thus neglecting the possibility of understanding broader contextual factors that can influence an athlete's transition out of sport.

Within the context of high-performance sport, funders of the Canadian Sport System continue to allocate resources to prepare and support HPAs for their lives after sport, yet resources are utilized by only 36% of eligible HPAs (Brassard et al., 2022; Game Plan, 2023). In an attempt to understand the low utilization rate, researchers have identified that HPAs perceive their sport environment (a) enables, (b) restricts, or (c) hinders their capabilities to prepare for retirement (Brassard et al., 2023). While such advancements further our understanding of the environmental barriers HPAs can encounter when seeking retirement support, perspectives from other members in sport organizations continue to be ignored.

Gaining a broader organizational perspective has shown to advance our understanding of HPAs' well-being (Sauvé et al., 2023) and mental health (Poucher et al., 2023). As such, the combination of environmental athlete retirement barriers and the low utilization rate of athlete retirement resources suggests there are nuanced environmental factors that contribute to an HPA's ability to prepare for retirement. Therefore, a broad exploration is warranted to advance our understanding of athlete retirement and identify potential unknown barriers and facilitators.

The aforementioned organizational gaps have provided the rationale to conduct this dissertation with the goal of exploring the perspectives of members within the sport system. This will give researchers a better idea of the understanding and experiences sport members have of retirement support mechanisms. Additionally, the researcher aimed to collaborate with sport members to design prototypes that address the barriers influencing HPAs' access to retirement support mechanisms.

This research is contextualized within a high-performance sport setting in Canada. HPAs within this environment train to compete at the Paralympic, Olympic, Pan Am, or Para Pan Am Games. These athletes are categorized within the Train to Compete and Train to Win stages of the Long-Term Athlete Development model (Balyi et al., 2013). The authors hope that the findings from this dissertation can be used to decrease the barriers HPAs face in their efforts to access retirement support. The findings from this research aim to make methodological, empirical, and theoretical contributions, as well as suggesting practical implications.

Literature Review

Athlete Retirement

Over life's course, one will encounter several transitions that result in changed routines, relationships, roles, and responsibilities (Goodman et al., 2006). One significant life event rather unique to HPAs is their transition out of sport. HPAs experience either an anticipated or unanticipated transition from sport. In both instances, HPAs have reported experiencing physiological, psychological, social, and emotional challenges related to the discontinuation of their chosen sport (Hansen et al., 2019; Park et al., 2013).

At the same time, HPAs invest a large amount of time and effort in maintaining their ability to compete on the international stage. Alfermann and colleagues (2004) described an athlete's journey from their first participation to career conclusion as a miniature life with stages parallel to childhood, adolescence, adulthood, and senior-hood. Similar to gerontological theories and transitional phases, athletic retirement is influenced by the maintenance of healthy and unhealthy behaviours (Reifsteck et al., 2015). Researchers have moved beyond viewing an athlete's transition out of sport as an abrupt singular event because an athlete's transition occurs over an extended period (Wylleman et al., 2004). With the understanding that retirement is a phase, researchers can now explore transitions through a holistic and longitudinal perspective to share findings pertinent to minimizing the retirement-related challenges encountered by athletes.

While preparing for this transition, researchers have advised HPAs to acquire skills over the course of their athletic careers to support their ability to adapt to a life without sport (Taylor & Ogilvie, 1994). Their inability to adapt to life after sport can result in psychosocial strains (Newman & Newman, 2006); psychological challenges including depression, loneliness, low-self-esteem (Wylleman et al., 2020); alcoholism and substance abuse; eating disorders; identity confusion; low confidence; and, in worst cases, an attempt at or death by suicide (Gouttebarga et

al., 2017; Lavallee et al., 2000). In the past few decades, the transition literature has heavily explored transition-related challenges; however, an athlete's transitional outcomes vary (Schlossberg et al., 2011). If HPAs are taught to transfer skills (e.g., time management, performing under pressure, and organization) from training to life, utilize social support (Fernandez et al., 2006; Wippert & Wippert, 2008; Young et al., 2006) and seek positive role models who have gone through a similar transitional process (Harrison & Lawrence, 2003; 2004), their transition is more likely to occur naturally and positively. Although natural and positive transitions can occur for some HPAs, proactive preparation efforts are the most consistent factor in influencing the quality of the athlete's transition (Kuttel, 2017; Stambulova, 2003; Wylleman et al., 2020).

The past few decades have encouraged the development of theoretical models to understand the concept of an athlete's transition out of sport. For example, the human adaptation to transition model created by Schlossberg (1984) was used to understand the mechanisms of a sport transition. Though this theory contributed to the sport transition literature, the model was originally created for counselling clients and failed to account for specific operational components of a sport transition (Kuettel et al., 2017; Stambulova, 2007).

One should note, an athletes' retirement presents unique differences when compared to other occupational forms of retirement. Athletes tend to retire at a much younger age when compared to traditional occupation retirement. As such, the age discrepancies can illuminate financial considerations unique to each athlete (Tupacyupanqui, 2023). Some athletes who retired in their twenties may have limited or nonexistent work experience or education due to their years of athletic commitment (Taylor & Ogilvie, 1994). In sum, athletes who are retiring can face a plethora of financial challenges attempting to enter the workforce.

In turn, Taylor and Ogilvie (1994) developed the athletic career termination model to propose reactive cognitive, emotional, behavioural, and social intervention strategies. Their research highlighted the importance of proactive rather than just reactive transition strategies (North & Lavalley, 2004; Stambulova, 2012). Accordingly, Stambulova (2003) created the athletic career transition model, which researchers employ to explore the transitional phases of sport such as sport initiation to senior, senior to high-performance, and high-performance to sport termination. This model proposed that the transitional experience is dependent on access to coping resources. Moreover, Kuettel et al. (2017) used an ecological framework to study cross-cultural transitions out of elite sport within the Swiss, Danish, and Polish nations. Their findings were built on Stambulova's (2003) existing framework. They created an ecological perspective on the transition out of elite sport to assess the preconditions for the transition, cultural differences, and life and work situations of retired HPAs.

As researchers make attempts to assess the quality of an athlete's transition with various models, they lack a consensus regarding how to measure the quality of a successful transition (Stambulova et al., 2012). Their lack of consensus has resulted in the creation of numerous measurement tools like well-being (Stephan et al., 2003), life satisfaction (Werthner & Orlick, 1986), social connectedness (Newman & Newman, 2006), and dissatisfaction to assess individuals at the end of their career (Alfermann et al., 2004; Stambulova et al., 2007). According to the current literature, an individual's transition is successful if they transfer skills learned from sport to life and if they can identify that they will have a life and future expanding beyond their athletic career (Stambulova, 2003; Wylleman et al., 2020). Researchers have found athletes who prepare for retirement by engaging in proactive measures such as planning, or

establishing and strengthening elements of themselves beyond their athletic performance to be better positioned to navigate their retirement challenges (Kuttel, 2017; Stambulova et al., 2012).

To better prepare and support Canadian HPAs for their inevitable transition out of sport, the Canadian Olympic Committee, the Canadian Paralympic Committee, Sport Canada, and the Canadian Olympic and Paralympic Sport Institute Network, collaborated to create Game Plan in 2012. Game Plan is a third-party organization fostered to improve athlete life-sport balance, post-sport career planning, and sport performance optimization (Game Plan, 2023). As an organization, Game Plan takes a holistic approach to enable HPAs' success in sport and life by equipping athletes with the tools to stay in sport longer, perform better, and retire healthier (Game Plan, 2023). The program allows a carded ("carding" refers to financial assistance from Sport Canada's Athlete Assistance Program) HPAs free access to education; resources about their careers, communities, and skill development; as well as additional physical and mental health resources, external to their sport environment (Game Plan, 2023).

Despite consistent findings deeming proactive retirement planning to be advantageous to HPAs' transitions and life after sport (Kuttel, 2017; Stambulova, 2012), and granting carded athletes' free access to Game Plan's resources only 36% of HPAs in Canada are utilizing Game Plan's retirement support (Brassard et al., 2022). HPAs have reported being hesitant to engage in proactive career planning due to the fear of being perceived as distracted or as attempting to withdraw from their athletic responsibilities (Brassard et al., 2022; Murdock et al., 2014). HPAs schedules are stretched across numerous responsibilities including practices, film sessions, mental training, weight training, rehabilitation, school, work, sleep, and social time (Murdock et al., 2014; Sutcliffe et al., 2021). The time spent on performance-related activities can make exploring advantageous resources for life after sport difficult for HPAs (Smith & Hardin, 2018).

Despite the research advancements and expansion of retirement resources, HPAs continue to encounter cultural and environmental barriers in pursuit of their proactive retirement preparation (Brassard et al., 2022; Kerr et al., 2020; Stambulova et al., 2020). For example, Brassard and colleagues (2022) explored the environmental factors in the Canadian high-performance sport system that allow HPAs to plan and prepare for their retirement. After conducting 14 interviews with HPAs, researchers determined sport organizations foster environments that either (a) enable, (b) restrict, or (c) hinder HPAs' capabilities to plan or prepare for retirement. Their findings were instrumental in highlighting the consequences of the prevailing cultural practice of seeking performance perfection, which results in HPAs neglecting life domains outside of sport (Hardy et al., 2017; Sauvé et al., 2023).

Resultantly, a new focus on support personnel and performance partners and their role in constructing cultural environments is necessary as their roles directly impact HPAs' capabilities to plan or prepare for their retirement from sport. HPAs who often lack the adequate skills and expertise to determine proactive and reactive retirement plans are poorly positioned in specific sport environments to prepare for their inevitable retirement from sport (Sutcliffe et al., 2021). As researchers around the world continue to explore the multifaceted phenomena of athlete retirement, further research is needed to understand, develop, and maintain healthy cultural environmental practices that better prepare and support HPAs' retirement.

Canadian Sport System

The Canadian high-performance sport system is composed of athletes, support personnel and performance partners, across roughly 95 sports with athletes that compete in the Paralympic, Olympic, Pan Am, or Para Pan Am Games (Canadian Olympic Committee, 2021; see Appendix A for full list of sports). Each sport is governed as a non-profit National Sport Organization

(NSO), serving as an independent hub for members to promote practices centred around HPAs' success. A culture is established and maintained by rules, regulations, legislations, ethics, and sport specific contexts, which is reinforced through the repetition of habits, beliefs, and conformity (Coker-Cranney et al., 2018). Sport cultures are usually environments where an athlete can focus on their development and performance, but sport cultures can also present risks to HPAs through social pressures that may not have positive effects on HPAs' mental health and well-being (Van Slingerland et al., 2019; Poucher et al., 2023)

As non-profit organizations, NSOs are heavily dependent on funding agencies to subsidize training and performance for facilities, amenities, staff, travel, competition, etc. Furthermore, selected HPAs on national teams receive financial support from Sport Canada's Athlete Assistance Program (Athletes Canada, 2020). Select HPAs are identified as "carded HPAs" and can use the Athlete Assistance Program funding for the following: "living and training allowance, tuition and deferred tuition support and special-needs assistance" (Athletes Canada, 2020). HPAs who have been "carded" for a minimum of three years are eligible for financial retirement adjustment support (Game Plan, 2023). Notably, not all HPAs receive carding financial support; therefore, not all Canadian HPAs have free access to resources that can prepare or support their retirement from sport.

As well, sport organizations work with various performance partners, and each performance partner has a unique role in supporting and advancing sport in Canada. One notable partner is Own the Podium. Their mission is simple: support Canada's pursuit in being one of the world leaders in performance at the Olympic and Paralympic Games (Own the Podium, 2021). Own the Podium assesses sport organization's Olympic and Paralympic performance potential and provides suggestions to government funding parties for the distribution of investments and

funds accordingly. With government funding distributions surpassing four million dollars for specific organizations, Own the Podium's role in providing recommendations that financially support the advancements of sport in Canada is significant and greatly impacts HPAs. However, historically, sport funding models that primarily prioritize results have contributed to consequences that directly affect the exploitation, well-being, mental health, and retirement preparation of HPAs (Haut et al., 2016; Kerr et al., 2020; Reardon et al., 2019; Sauvé et al., 2022; Sauvé et al., 2023). The trickle-down effect of performance incentivized funding can foster sport environments that are overly performance driven, which can result in HPAs' lives outside of sport being neglected and undermined (Esopenko et al., 2020; Hardy et al., 2017).

Athlete wellness organizations such as Game Plan, mental wellness centres such as the Canadian Centre for Mental Health and Sport, as well as guiding documents of the Canadian sport system such as the Canadian High-Performance Sport Strategy are trying to shift the Canadian sport system from a solely performance driven environment to a value-based sport environment that prioritizes athletes' wellness (Van Slingerland et al, 2021) and celebrates athlete's participation and excellence in sport through fair and ethical means (Canadian High-Performance Sport Strategy, 2019). Collaboration and progression efforts are required to ensure our understanding of athlete wellness continues to expand to consider elements such as athlete retirement. Two additional instrumental performance partners include the Canadian Olympic Committee and the Canadian Paralympic Committee. Both parties underwrite HPAs' Olympic and Paralympic pursuits of podium success through their support, guidance, investments, and advancement of Olympic and Paralympic values.

Taking a top-down view of the Canadian sport system, performance partners such as Own the Podium, Game Plan, the Canadian Olympic Committee, and the Canadian Paralympic

Committee are key decision makers who provide guidance, policies, frameworks, structure, financial recommendations, and support to advance the performance and well-being of members in the sport community (Fletcher & Arnold, 2011). Within the sport system, the next level of power and authority includes support personnel, formally known as an integrated support team. Support personnel in a sport organization can be performance coaches, athletic therapists, physiotherapists, sport medicine doctors, strength and conditioning coaches, sport nutritionists, mental health practitioners, and mental performance consultants (Canadian Olympic and Paralympic Sport Institute Network, 2023). Under the guidelines, suggestions, frameworks, and resources such as the Canadian High-Performance Sport Strategy (Canadian High-Performance Sport Strategy, 2019) provided by performance partners, support personnel collectively employ their areas of expertise to provide HPAs with an integrated form of care that advances HPAs' performance and well-being.

The final population layer within the sport system includes the HPAs who earn the right to hold a national roster position to represent Canada on the international stage. Each athlete engages in a wide variety of training and development activities in pursuit of performance excellence facilitated by support personnel. HPAs are subject to guidelines, policies, and frameworks issued by performance partners and reinforced by support personnel. Therefore, HPAs are under the guidance and support of the Canadian sport system from the moment they earn a national team roster position until two years following their retirement.

To recapitulate, the Canadian sport system consists of performance partners, support personnel, and active and retired HPAs. Each member plays a role in establishing, upholding, or adhering to the culture of high-performance sport in sport organizations across Canada. The high-performance sport culture in Canada has been reported to foster unhealthy training

environments that make it difficult for HPAs to maintain well-being (Sauvé et al., 2023), mental health (Poucher et al., 2023), and prepare and plan for their lives after sport (Brassard et al., 2022). An environmental exploration can enhance our understanding by highlighting the complexities of athlete retirement and better position researchers to develop applied frameworks or strategies for sport organizations to best prepare and support their HPAs in their retirement transition (Stambulova et al., 2020; Brassard et al., 2022). Research is needed to better understand the factors impacting HPAs in the Canadian sport system. Therefore, this dissertation explores this gap by collaborating with active HPAs, retired HPAs, support personnel, and performance partners to identify the cultural and environmental barriers and facilitators HPAs face when engaging with retirement support mechanisms. In turn, this research aims to collaboratively design solution-driven athlete retirement prototypes to address such barriers and support HPAs' long-term well-being.

Personal Interest

My previous life events have influenced and led me to focus on this research project. As the third child in a large family, my childhood was filled with non-stop competitive physical activity. I viewed every sport I came across as an exciting opportunity to learn new skills and eventually compete against my siblings. My competitive nature continued to grow throughout my high school years, and I was determined to earn the right to compete at the next level as a university student-athlete. Throughout my high school years, I alternated between basketball and lacrosse, but I avoided specializing in one specific sport. My indecisiveness carried on into my postsecondary education when, as an NCAA scholarship athlete, I initially committed to Lindenwood University with a basketball scholarship, but I soon transferred schools and sports to conclude my collegiate athletic career as a lacrosse athlete at Delaware State University.

One aspect I feared throughout my athletic career was the thought of what my life would be like without high-level competition. I played basketball and lacrosse during opposite seasons; therefore, I never had long periods without high-level competition. The act of ignoring my life priorities outside of my sport performance was a common habit I shared with my athletic peers. Though we knew our athletic careers would one day conclude, we shared an unspoken agreement that we would not discuss life after sport until we deemed it necessary. Upon the completion of my undergraduate degree in the Spring of 2017, the reality of my athletic retirement finally hit me. During this time, I received confirmation that I was accepted into the University of Ottawa's Master's in Human Kinetics and that I would receive educational training and competencies to work in sport as a mental performance consultant.

As excited as I was to further my education and remain in the world of sports through academia, I felt strange returning to school in the Fall of 2017 solely as a student rather than a

student-athlete. I started recognizing a significant decrease in my mood, focus, level of motivation, and how I used my free time. In my role as a graduate student, I had access to extensive literature on athlete retirement. Accordingly, I studied the literature around sports retirement and quickly learned that I was experiencing the “athletic transition blues” (Saxe et al., 2017). I felt completely unequipped to handle what I was feeling, and I worried I would never enjoy my life without competing in competitive sport.

After months of mundane days and leaning on various forms of social support, I progressed through my graduate program and received the training and competencies to serve as a mental performance consultant. I learned the skills and practices to support not only myself, but also HPAs who faced similar transition challenges. As I continued to get familiar with the current athlete retirement literature, I began to learn about the retirement support offered to my peers who competed nationally and internationally. My academic growth stirred my passion for athlete retirement, and I knew I wanted to make an impact by contributing to this field to prevent other HPAs from experiencing what I went through. Accordingly, I enrolled in the Human Kinetics PhD program at the University of Ottawa to research and provide evidence-based resources to organizations and institutions, so they can advance practices to better prepare HPAs for their inevitable transition out of sport.

The lens through which I view the world has expanded from a student to an athlete, to a mental performance consultant, and now a researcher. These different perspectives are reflected in my approach as a researcher who engages in participatory research.

Research Purpose and Questions

The purpose of this doctoral dissertation was to collaborate with members of the Canadian high-performance sport system to identify athlete retirement needs and collaboratively innovate solution-driven athlete retirement prototypes to address the identified needs. Three research questions, each with a corresponding research goal, guided this research: 1) How are HPAs utilizing and accessing retirement support?, 1a) Understand how HPAs are utilizing Game Plan's resources, 2) What are sport members' assessments, understanding, and perceived gaps of athlete retirement resources?, 2a): Gain insight into the gaps and landscape of how retirement resources are perceived by sport system members, 3) How might sport members collaborate and design a tool to support athlete retirement gaps?, 3a) Facilitate a collaborative environment for sport members to design prototypes that address athlete retirement needs.

Stanford's d.school Design Thinking framework was used to support each research step, and the researchers embraced the collaborative guidance and insight from end-users. The project aimed for sustainable outcomes for end-users, thus, their input, guidance, and decisions were instrumental to every step of the project. Data collected for this research consisted of reports, interviews, video and audio recordings, and sticky notes used during the co-design group sessions. All forms of data were analyzed to answer the research questions. The research steps that guided this study and the corresponding framework are shown in Figure 1 below:

Figure 1.

Research Outline

	Phase 1	Phase 2a	Phase 2b	Phase 3
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Research Question	How are HPAs utilizing and accessing retirement support?	What are active and retired athletes' assessment, understanding, and perceived gaps of athlete retirement resources?	What are sport personnel and performance partners' assessment, understanding, and perceived gaps of athlete retirement resources?	How might sport members collaborate and design a tool to support athlete retirement gaps?
Goal	Understand how HPAs are utilizing Game Plan's resources	Gain insight into the gaps and landscape of how retirement resources are perceived by active & retired athletes	Gain insight into the gaps and landscape of how retirement resources are perceived by sport personnel and performance partners	Facilitate a collaborative environment for sport members to design prototypes that meets athlete retirement needs.
Participants	Active and retired HPAs	6-10 Active and retired HPAs	6-10 Support personnel & Performance partners	Active and retired HPAs, support personnel, & performance partners
Data Sources	Descriptive data analysis & Game Plan usage data	Semi-structured empathy interviews	Semi-structured empathy interviews	Co-design Sessions

Philosophical Positioning

This qualitative research project was philosophically positioned in a participatory paradigm. Derived from the qualitative research tradition, a participatory worldview is fundamentally experiential, which allows researchers to explore a participant's being and knowing through collaborative inquiry (Heron & Reason, 1997). Participatory inquiry was adopted due to the benefits of researchers conducting research *with* participants. This collaboration allows for the co-creation of knowledge through interactions with co-researchers who are traditionally identified as research participants (Reason & Heron, 1986). The participatory element is operationalized through the collaborative involvement of the co-researchers in each phase of the study, including the research process, methods, analysis, evaluation, and dissemination (Bray et al., 2000; Swain & French, 2004). The ontological, epistemological, and methodological underpinnings of the participatory paradigm that guided and influenced the lens used to construct and conduct this research will be discussed in this section (Lincoln et al., 2017).

Ontology

The ontological foundation of participatory research assumes there is unity between the objective world that is subjectively represented (Breu & Peppard, 2003). Knowledge in this paradigm is understood both objectively and subjectively, which is manifested as an understanding of meaning (Reason & Bradbury, 2006). In the case of athlete retirement, the outer world is objectively given; however, for an active athlete, retired athlete, or as an individual in the sport system, experience and knowledge are subjectively valued and accepted as truth. In the participatory paradigm, researchers work with participants to contextualize knowledge, experiences, and realities of the researched population (Heron & Reason, 1997). The participatory nature of this worldview emphasizes collaboration and promotes that knowledge is

a co-created phenomenon of participants' subjective-objective realities (Lincoln et al., 2017).

Accordingly, the social co-creation of participants' subjective-objective relativities occur during periods of data generation in the form of interviews and co-design group sessions (Guba & Lincoln, 2005).

Epistemology

The epistemological foundation of this paradigm relies on the belief that the participants' insider knowledge is acquired from their experiences in social conditions. Through integrating these experiences with existing public literature and communal dialogue, the participants and the primary researcher can collaboratively generate knowledge by means of solutions (Rusmore, 1996).

Further epistemological explanation is provided by Heron and Reason (2008) as they stated that people weave ways of knowing, thereby constructing participatory action research. The four ways of knowing—experiential, presentational, propositional, and practical knowing—are descriptive ways through which individuals come to know and understand their interactions with reality (Heron & Reason, 2008). Experiential knowing is exerted through direct encounters with individuals and the world in which one lives. Presentational knowing draws on an individual sharing their experience through creative forms of communication (e.g., storytelling, art, movement, etc.). Propositional knowing emerges through the concepts and propositions of an individual's experience and exploration, and practical knowing is experienced through accumulating knowledge, which is turned into action or practice cooperatively in the world (Heron & Reason, 2008). These four ways of knowing are interrelated and overlap throughout the research process (see Appendix B).

Methodology

Participatory researchers work with community members to strengthen participants' ownership of solutions to inherent issues. This collaborative problem-solving approach allows for the creation of a valid and ethically sound technique that incorporates the future end-users through every phase (Leung et al., 2004). According to de Koning and Martin (1996), participatory approaches can fill gaps between concepts and models by helping interpret reality and the perspectives of individuals. Furthermore, Chambers (1997) argued that participatory approaches “break down the mystique surrounding research... [to ensure] the problems researched are perceived as problems by the community to which the research is directed [;] it helps to develop self-confidence, self-reliance, and skills within people who the research is directed to” (p. 9). When adopted appropriately, the participatory approach should produce findings, in this case, that can directly impact the retirement preparation for HPAs in the Canadian sport system.

Theoretical Framework

Three complementary theoretical frameworks were used to organize and guide these qualitative studies. The conceptual model of adaptation to retirement among HPAs was used to frame the researchers' understanding of athlete retirement (Taylor & Ogilvie, 1994), the Design Thinking (Hasso Plattner d.School, 2022) process was used to guide and organize our ways of thinking and outline the iterative steps that would influence the research process, and Bronfenbrenner's Ecological Systems Theory (EST; 1977; 1979) conceptually positioned the research to value and prioritize the complex nuances often presented in multi-level systems. The frameworks share a compatible alignment under the participatory paradigm. Across frameworks, an emphasis is placed on conducting research with participants, specifically product end-users for this research project, in a specified large system which, in this case, is the Canadian high-

performance sport system. This section will provide further insight into why and how all the frameworks were used to guide this research.

Athlete Retirement Model

Researchers in the 1980s developed an interest to explore HPAs' experiences retiring from professional sports (Ogilvie & Howie, 1982). As a novel topic, researchers explored this phenomenon within various competitive tiers and leagues (Greendorfer & Blinde, 1985). Though this research provided insight highlighting the difficult and distributive challenges of athlete retirement, these studies used conceptual frameworks often drawn from contexts outside of sport, such as professional retirement (e.g., Rosenberg, 1982), social gerontology (e.g., Greendorfer & Blinde, 1985), and counselling theories (e.g., Havighurst & Albrecht, 1953). In 1992, Baillie and Danish outlined the need for conceptual frameworks to support sport retirement and to better understand and prepare HPAs for retirement. They identified that HPAs encounter unique challenges grappling with life after sport and presumed a context specific framework could support and advance athlete retirement literature. They concluded HPAs, coaches, management, peers, and sport psychologists should be more aware of these retirement related difficulties in hopes of decreasing the number of HPAs who are poorly prepared for life after sport. Taylor and Ogilvie (1994) used the suggestions by Baille and Danish (1992), as well as previously published research as a springboard for conceptualizing their framework. Their resulting conceptual model of adaptation to retirement among HPAs was used as a general guide to frame the researcher's understanding of athlete retirement in support of this dissertation (see Appendix C). The framework provides a conceptualization of the various factors that can influence an HPA's retirement experience, such as individual characteristics, social standing, and access to retirement

resources. More specifically, this framework identifies five aspects to consider when researching athlete retirement as explained below.

The first consideration pertains to the reasoning for one's retirement: age, deselection, injury, or free choice. Exploring the reason and the perception of autonomy regarding the decision to retire can provide rich insight into an athlete's retirement experience. For example, some athletes may retire earlier than they anticipated due to deselection or injury. Their unforeseen retirement may be accompanied by being ill prepared, feelings of anger and disappointment, and sometimes may require an intensive physical therapy commitment; all of which can influence an athlete's retirement experience.

The second consideration focuses on how one adapts to life without sport. For example, during potential psychological, social, financial, and occupational changes, how does one cope with self-identity, social identity, and perception of control? These areas of exploration can reflect whether a HPA had a singular focus on their career or if they invested in developing themselves and their lives holistically throughout their career (Taylor & Ogilvie, 1994). The third consideration seeks to explore what retirement resources an athlete had access to proactively and reactively for their retirement. Retirement support can equip HPAs with the coping skills needed to adjust to their experience; however, if HPAs do not have access to these resources due to environmental barriers, they are left to navigate these changes on their own. This phase considers formal forms of support such as mental performance consultants, sport psychologists, or counsellors and accounts for informal forms of support such as social support from peers, teammates, or family.

The final consideration of this conceptual framework is an intervention for athlete retirement difficulties. If an athlete has access to and utilizes formal support, an intervention to

support the retirement-related difficulties they encounter could contribute to their retirement experience (Taylor & Ogilvie, 1994). In line with this dissertation, this framework guided the researcher's understanding of athlete retirement and supported the construction of research questions, research objectives, and the research process.

Design Thinking

The rigorous practice of Design Thinking can be described as a reflective, iterative, and creative framework (Irbite & Strode, 2016), which directs and enhances a needs-based design process (Irbite & Strode, 2016). Design Thinking extends beyond a traditional framework and offers a paradigm, methodology, methods, tools, and techniques to guide researchers. Design Thinking positions researchers to work with wicked problems; these problems offer solutions that either improve or decline the targeted issue, rather than fully resolving it (Ritter & Webber, 1973). These wicked problems, such as low athlete retirement resource usage, are approached with an open mind as researchers lean on reflecting in action and on action, as well as abductive reasoning to guide their form of logic inference and meaning making (Laursen et al., 2017). Efforts to search for solutions with abductive reasoning principles are facilitated by using solution-driven tools and techniques. These methods are practical in nature and are used to broaden one's perspective to first better understand the problem and second to evoke creativity in generating solution-driven ideas (Panke, 2019).

The essence of Design Thinking as a methodology is grounded in human-centered innovation (Luka, 2014). Research is conducted with participants who are also end-users of the final design. As such, the terms 'participants' and 'end-users' are interchangeable within this approach. In 1980, David Kelley, a mechanical engineering educator at Stanford University, initiated the practice of Design Thinking. Kelley learned solution-driven innovation was most

fruitful when he collaborated with individuals with diverse expertise rather than experts within the same discipline (Banerjee & Gibbs, 2016). In addition to collaborating with individuals from external disciplines, Design Thinking researchers valued sustainability and believed that if designs aimed to solve problems for everyday people, collaboration from everyday people was essential to creating sustainable and applicable designs (Dam & Siang, 2019). Therefore, the process of Design Thinking places a value on the who (i.e., the designers) and the what (i.e., the design) to ensure human-centred design (Bazzano et al., 2017).

Through the prioritization of end-users' needs, researchers collaborate with a targeted ecosystem to facilitate creative solution-driven design that centres on the human end-users' needs (Aflatoony & Wakkary, 2015). As such, Design Thinking offered a complementary framework to the aspired research goals and questions of this dissertation. Notably, Design Thinking practices have contributed to small and large advancements in various disciplines; Design Thinking is a simple, replicable framework that has fostered collaborative, solution-driven innovation in the fields of medicine, global health, education, engineering, business, math, and computer science (Banerjee & Gibbs, 2016; 1998; Panke, 2019; Razzouk & Shute, 2012). However, to date, the application of Design Thinking practices is limited in the field of sport and exercise psychology and, more specifically, within the area of athlete retirement. Prominent athlete retirement researchers have called for diversified approaches to better understand the systemic and cultural elements contributing to athlete retirement experiences (Stambulova et al., 2020). To address this, Design Thinking was chosen to inform and theoretically guide this qualitative research.

In 1987, Peter Rowe, a professor from Harvard University, published a book entitled *Design Thinking* that outlined an explanation, purpose, and possibilities for Design Thinking

application in architecture. As the years progressed, his Design Thinking method gained mainstream attention, and academics applied it in diverse fields of research. Many researchers have since published literature outlining various uses of Design Thinking methodologies, and various theoretical frameworks were created to encourage solution-driven projects which centred on humans' needs (Baker & Moukhliiss, 2019).

In 2004, Stanford University launched the Stanford Hasso Plattner Institute of Design, also known as 'd. school' (Liedkta, 2015). The d. school simplified Design Thinking practices by outlining an iterative nonlinear 5-step design process researchers and practitioners can employ: 1) empathize, 2) define, 3) ideate, 4) prototype, and 5) test (Hasso Plattner d.School, 2022). Each phase can leverage various forms of data ranging from interviews, observations, storytelling, rapid concept development, prototyping, persona creation, assumption testing, drawing, or other forms of artwork (Chasanidou et al., 2015). Researchers or practitioners select specific methods to generate collaborative innovation by end-users, presenting distinctive methods of creative processes. Participants are guided through various forms of creative reflection that results in the emergence of innovative solution-driven perspectives (Bazzano et al., 2017).

The first phase is used to learn about the end-user and their problems. The term empathy is used to emphasise the importance of seeking a deep emotional understanding of the user's experience from the user's perspective (Kelley & Kelley, 2013). Researchers are encouraged to do this by seeking to understand the specific landscape from the end-user's perspective. This can be done by identifying the diverse roles held across the specific landscape and accessing preliminary and comparable research to further the researchers' understanding of various end-user's perspectives.

Once insight is gathered and organized in the empathize phase, researchers then work towards defining the end-users' problem to be addressed. Researchers are encouraged to work with a diverse sample of end-users to identify the prioritized problem from multiple perspectives (Henriksen et al., 2017). For example, if the area of focus is athlete retirement within a sports system, a diverse sample of end-users would include not only active and retired HPAs, but also individuals fulfilling the various roles who work with or whose work impacts HPAs such as support personnel, and performance partners. This information can be obtained by interviewing a diverse range of end-users, observing environments, storyboarding, and creating vignettes or personas. Prior to advancing to the next phase, researchers work with end-users to define the problem that will be addressed.

The next phase of the process consists of ideating through exercises. During this phase, researchers guide end-users through creative exercises intended to foster innovative solutions to address the defined problem. Researchers share all the previous collected data and insight obtained from the earlier phases. Together, researchers and end-users collaborate to ideate a solution. Often used to enhance the number of ideas generated by a group of individuals, the technique of collaborative ideating can be time-consuming. Such creative exercises that aim to generate collaborative solution-driven ideas are as follows: mind-mapping, sketching, and time boxing. Following the discussions of ideas, researchers and end-users work together to review each suggestion and narrow the focus by using a funnel technique to collectively identify the most suitable ideas. Once end-users and researchers have selected their strongest suggestions, they can progress to the next phase.

During the prototype phase, researchers and end-users turn ideas into tangible prototypes by drawing sketches or drafting models. The purpose of this phase is to translate the initial idea

into a formed, but makeshift product end-users can interact with. In this phase, time is allocated for end-users to familiarise themselves with the prototype(s).

The final phase of this process is for testing and evaluation. After end-users interact with the designed prototype(s), researchers seek to gather the end-users' feedback, thoughts, perception of effectiveness, and anticipated challenges. Through this process of elimination, the researchers collaborate with end-users to identify the best model(s) to be rejected, reconstructed, and eventually, accepted.

Though phases are numerically outlined, the cycle is nonlinear. Researchers are encouraged to redefine and reassess previous steps prior to progressing to the next phase (Hasso Plattner d.School, 2022). Researchers may return to previous Design Thinking phases prior to progressing or may even engage in a specific phase multiple times. As previously mentioned, each phase propels the next; therefore, researchers may feel as though they have insufficient or inadequate data generated to progress or that they have tested a proposed idea and require collaborative support to revise a prototype to progress further in their research.

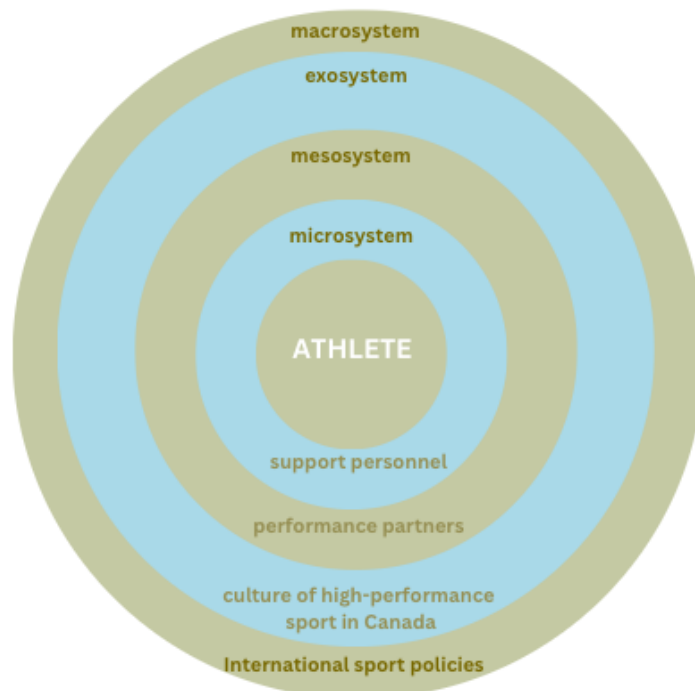
The Design Thinking mode of reasoning is abductive, which is contradictory to traditional science investigations as extant forms of inquiry (Liedtka, 2018). For instance, in traditional forms of research, researchers use deductive forms of reasoning guided by established principles or sound forms of logic, whereby with Design Thinking, researchers are required to make inferences and progress through phases with acquired and available evidence, some of which may be incomplete or limited forms of information. This unique methodology best suits the desired research objectives as it allows researchers to work with end-users to learn of their needs, experiences, and desires and collaboratively create the best solution-driven design, rather than propose solutions that are not malleable.

Ecological Systems Theory

EST provides a framework that centres on human development and considers the changing influences and environments within a large system (Bronfenbrenner, 1977; 1979). Naturally, with numerous humans interacting within a large, complex system, such as the Canadian high-performance sport system, multisystem insight is needed to understand the systemic opportunities and threats that influence an athlete's retirement experience (Bronfenbrenner, 1979; Strachan et al., 2016). EST is a complementary theory to guide this research adjacent to Design Thinking and is used to provide an in-depth understanding of the micro-, meso-, and exo-, and macrosystem that make up the sport ecological system (see Figure 2 below).

Figure 2.

Connection of EST and Canadian Sport System



Note. This figure illustrates the parallels from Bronfenbrenner's EST and the Canadian high-performance sport system.

In this research, the athlete is at the core of the EST. Each surrounding layer provides in-depth context to expand the understanding of human development. The microsystem is the closest and most influential layer in the framework. This system considers the relationships and environments that one is primarily situated in. For example, one's family, roommates, home, work, and school may be considered within this system. For members who compete or work in sport, this system includes one's daily training environment and the people within it, such as HPAs, teammates, and performance support personnel. At the core, the human has a unique set of characteristics, personality traits, and tendencies that make each experience unique. Although two humans may grow up within the same microsystem, their experiences, relationships, and perspectives may be shaped differently.

Similarly, within the context of sport, two HPAs who share housing, commute to training, and socialize together may have different opinions of their coach or sport environment. As such, HPAs may share similar microsystems; however, their experiences may differ significantly due to their relationships with others within their microsystem layer. The style and quality of bi-directional relationships may be due to power imbalances, characteristics, socializing skills, or interaction frequency. This guiding principle influenced the relationship and environmental exploratory questions presented to participants. Furthermore, relationship dynamics were also considered when co-design group sessions were being organized. The co-design group sessions included various participants; however, to consider the implications of the participants' relationships within the same sport microsystem, no co-design groups included more than one person from an NSO.

External to the microsystem is the mesosystem. This system considers the relationship between microsystems and provides insight into how these relationships influence human development (Bronfenbrenner, 1979). For example, if a young child's microsystem includes home, family, and school, examining their mesosystem would consider the parents' relationship with their child's school, their child's teacher, and their child's peers. In the context of sport, this system would examine the relationship between an athlete's teammates and coaches or the relationship between a coach's players and personal family. The relationship between all subsystems is believed to influence how one navigates the world.

Moving away from the centre of the ecosystem, the next layer of the ecological system is the exosystem. The exosystem considers overarching systems in one's life such as associations, neighbourhoods, and government (Bronfenbrenner, 1979). Within this situation, an individual does not have immediate contact with these influences; however, the decisions and actions taken from these overarching systems influence their development and landscape in minuscule or significant ways. In a sport setting, these systems may include the Canadian Olympic Committee, the Canadian Paralympic Committee, Own the Podium, or Game Plan. Though HPAs rarely interact with the overreaching systems, these systems enforce rules, regulations, and practices critical to HPAs' development and the shaping of their sport's cultural environment.

The exterior-most layer is the macrosystem. This layer considers the social, cultural, and societal contexts of the ecosystem. To understand an ecosystem, researchers gather insight into the unique cultural systems that influence human development in formal and informal settings, which may include the following: age, gender, race, religion, community, and geographical location. For research projects that explore sport, examining macrosystems provides researchers with more context to better understand the participants' identity and their experiences

(Bronfenbrenner, 1979). In this research, participants were asked to identify their age, gender, race, and geolocation to ensure the sample size was diverse and to provide enhanced context to the readers of the final research report.

The EST provides guidance to explore the culture of an ecosystem and the multifaceted layers impacting human beings within it (Strachan et al., 2016). This methodology influenced the researcher's specification of interview questions to understand the interplay of layers and the lens through which the Canadian high-performance sport system was viewed within the context of this research.

Methods

Participants

An eligibility criterion for participants was established to include all end-users that would be influenced by the designed athlete retirement prototype. The multilayer ecological system of high-performance sport in Canada fosters fluid influences, relationships, and environments that impact the behaviour of all parties. As such, all members who were active HPAs, recently retired HPAs, support personnel, or performance partners in the ecological system of Canadian high-performance sport were eligible for the interviews and group co-design sessions. Criterion sampling (Higginbottom, 2004), snowball sampling, and purposeful sampling (Patton, 2015) were used to recruit participants for this study during the winter, spring, and summer of 2022. The specific eligibility criteria for this study consisted of individuals being in one of the following groups within the Canadian Sport System: (a) active carded HPAs, (b) retired carded HPAs who competed in the Tokyo Olympic or Paralympic Games, (c) active performance support personnel (i.e., athlete-facing performance staff), or (d) performance partners from either the Canadian Olympic Committee, Canadian Paralympic Committee, Game Plan, or Own the Podium.

The Tokyo Olympic and Paralympic Games concluded in the summer of 2021. Thus, all the HPAs who retired after the games were within the first 18 months of their departure from high-performance sport. The 18-month time frame has been indicated as the most susceptible time for individuals to encounter retirement-related challenges (Stephan et al., 2003). Working with retired HPAs during this time frame was most ideal to inquire about relevant retirement-related challenges.

Furthermore, to empower individuals to freely share their thoughts, feelings, and ideas during co-design sessions, specific NSO conflicts were monitored (Ayrton, 2019). A natural

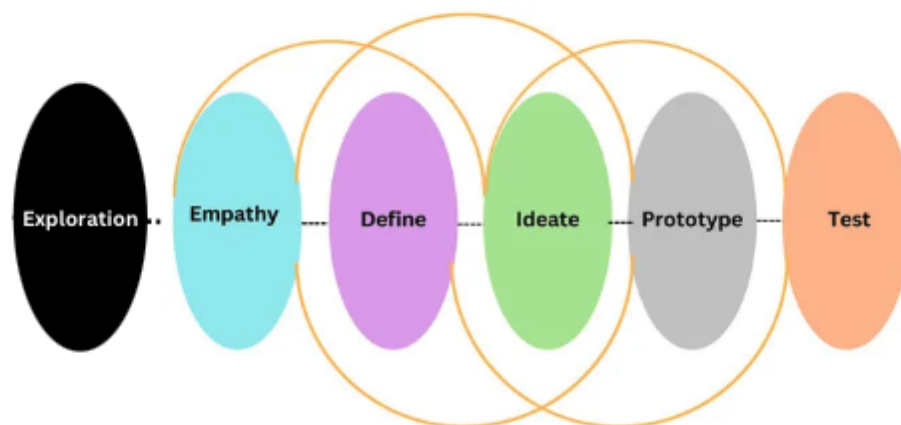
power imbalance exists among members across the high-performance sport system (Feddersen et al., 2021); therefore, co-design sessions did not include more than one individual from an NSO to limit the power imbalance. As well, information regarding end-users were protected with coded sports to maintain the participants' confidentiality.

Procedures

The creation of knowledge derived from this collaborative inquiry project was a shared effort of the initiating researcher and the participants. The methods and guiding framework used to generate data in this study will be presented according to the phases in which each method was used. Though each subsequent phase was influential in guiding the next phase, this iterative process overlapped during multiple stages of the study. The phases are presented in Figure 3 below. While there are various models of Design Thinking, with different steps, the one in Figure 3 was the one used in this research.

Figure 3.

Design Thinking Process



Note. Adopted from the Stanford d.school Design Thinking process (Hasso Plattner Institute of Design, 2023), the illustration above demonstrates the iterative process that occurred during this research project. The ovals represent each step. The black line connecting through each oval demonstrates the aspired order of steps, and the semi-circle linking connecting ovals demonstrates the iterative process that occurred. An additional exploration step was added to the process to further the researcher's understanding of the contextual landscape.

Phase: Explore

Prior to beginning the Design Thinking process, the researcher engaged in an exploratory exercise to gain familiarity with the retirement landscape and previous research findings. The purpose of this process was to understand how athlete retirement mechanisms were utilized by active and retired HPAs in the Canadian sport system. This process was guided by the following research question: How are HPAs utilizing and accessing retirement support? During this phase, relevant literature was reviewed, and forms of formal and informal data were collected to strengthen the researcher's understanding of the landscape and form a deeper sense of connection to retirement gaps.

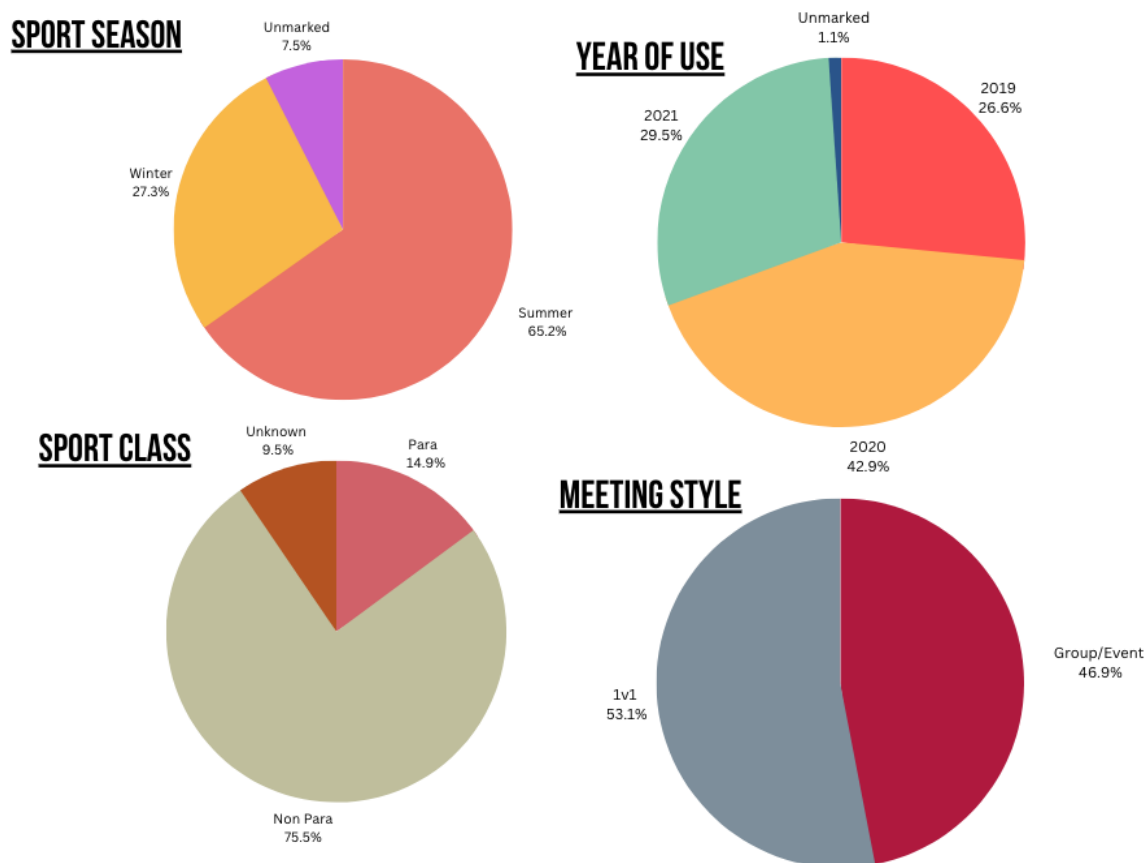
To begin, the researcher reached out to personal contacts within the sport community to gather insight on how athlete retirement is perceived. The researcher engaged in four informal calls with two high-performance directors, a sport for life employee, and a coach. All four individuals perceived Game Plan to be the athlete retirement hub and strongly encouraged the researcher to contact members within Game Plan's organization. Following these calls, the researcher reached out to Game Plan advisors and began a series of ongoing conversations to learn about the perceived athlete retirement gaps. To gain insight on HPAs' perceptions of gaps, the researcher explored Game Plan's usage data.

Once ethical approval was provided by the University of Ottawa, Game Plan shared their usage data for the years 2019-2021 in December 2021. The data outlined HPAs' usage rates for individualized and group forms of support from the following services domains: career, education, health, networking skill development, and unspecified. The sample size consisted of 8,579 data entries of individualized support and 4,027 data entries of group support. All the users were assigned randomized codes indicating their NSO affiliation, as well as the year and frequency in which each resource was accessed. An agreement with Game Plan was made to protect the confidentiality of NSOs. As a result, this section will describe the processes followed without disclosing information on the NSOs.

Explore: Data Analysis. A secondary data analysis was conducted on the existing Game Plan data to measure the usage of Game Plan's resources by athletes according to their NSO and assess relationships between usage and NSO funding to better understand how HPAs are utilizing Game Plan's resources. A Google spreadsheet was used to organize the usage from each NSO. From this analysis, the researchers learned Game Plan had 650 one-time users from the years 2019-2021. We also learned athletes would utilize Game Plan's resources on average 4.2 times, which roughly ranges from twice a year. Further findings are displayed in charts shown in Figure 4.

Figure 4.

Findings From Game Plan's Usage Data



Note: the following four pie charts provide a visual representation of the findings from the secondary data analysis on Game Plan's usage data.

The purpose of creating the pie charts was to provide landscape insights into how Game Plan's resources are utilized by HPAs across Canada. The following step in this phase consisted of creating a list that organized the amount of times each NSOs utilized Game Plan's resources from the years 2019-2031. This list supported the researcher's effort in implementing a diverse end-user recruitment practice for the next phase of the research study. NSOs organized in a usage list allowed the researcher to recruit participants from NSOs with high, medium, and low resource usage. This process was intentional to ensure insight and contributions to the research objectives were made from NSOs with varying retirement support use. Furthermore, this practice

aligns with the research purpose of designing feasible prototypes that can be adopted across the sport system (Bazzano et al., 2017).

Phase: Empathy & Define

After gathering insight during the exploration phase, the purpose of the empathy phase was to further understand the complexities of the end-users and define the problem by conducting empathy interviews (Henriksen et al., 2017). This phase contains significant overlap with the Define phase, as a result, the author will explain both together. Empathy interviews provided an opportunity to work with the end-users to better learn about their perspectives, behaviours, thoughts, and feelings (Dunne & Marin, 2006). The goal was to provide further insight and understanding for research question 2: What are sport members' assessment, understanding, and perceived gaps of athlete retirement resources? During this phase, participants were recruited, empathy interviews were conducted, interviews were transcribed, data were analyzed, and personas were constructed.

Empathy and Define Phase: Participant Recruitment. Participants were recruited for this phase using purposeful criterion and snowball sampling (Patton, 2015). Following the results from the usage chart organized in the Exploration Phase, the author organized the NSOs in three groups 1) high usage, 2) m usage, and 3) low usage. Such categories were generated on an excel spreadsheet. Participants from NSOs were recruited from the high, medium, and low, usage margins. A recruitment text (see Appendix D) was emailed to 50 participants in February 2022. Nineteen individuals agreed to participate in an individual interview. All the participants signed a consent form (see Appendix E) prior to being interviewed. A sample size of 4-6 participants for each group (i.e., active athlete, retired athlete, support personnel, and performance partner)

across the usage margins (i.e., top, middle, and lower) were desired to seek participation from a diverse sample of end-users (Banerjee & Gibbs, 2016).

Eligible end-users included all roles within the sport system such as active HPAs; retired HPAs; support personnel, including head and assistance performance coaches; athletic therapists, physiotherapists; sport medicine doctors; strength and conditioning coaches; sport nutritionists; mental health practitioners; mental performance coaches; high-performance directors; and performance partners, including individuals from either the Canadian Olympic Committee, the Canadian Paralympic Committee, Game Plan or Own the Podium.

Empathy and Define Phase: Data Generation. The data generated in this phase took the form of virtual empathy interviews (see Appendix E). Empathy interviews were conducted from February to April 2022. The 19 participants held diverse roles across the sport system, including four active HPAs, four retired HPAs, five support personnel, and six performance partners. The participants joined from British Columbia, Calgary, Nova Scotia, Ontario, and Quebec. The interviews consisted of questions seeking to explore the participants' understanding of the retirement mechanisms, their thoughts on proactive and reactive retirement support, and the gaps within the retirement landscape. The interviews ranged from 48–65 minutes with an average length of 53 minutes. All interviews were held virtually via the online platform Zoom. The participants provided consent for virtual calls to be recorded, transcribed, and used for the research study.

Empathy and Define Phase: Data Analysis. Abductive reasoning principles were used to form the logic inference and meaning making of this analysis (Laursen et al., 2017). More specifically, the researcher used Nielsen's composite persona approach and relied on the

guidance from Braun and Clarke's thematic analysis (2006; 2021) to analyze the empathy interviews and construct the composite persona. More specifically,

The online platform used to host the interviews generated a transcript for every interview. The researcher began the analysis by reading the transcripts, listening to the corresponding audio, and making necessary changes to support accuracy. Once the transcripts accurately reflected the interview recording, each transcript was emailed to each participant for review to ensure it was an accurate representation of their thoughts and feelings. If they felt the transcript poorly represented their thoughts, they were permitted to make changes accordingly. All 19 participants confirmed the transcript accurately represented their thoughts; no changes were made.

Then, data were reviewed and revised to gain familiarity. Codes were then established, outlining recurring sentiments, thoughts, and feelings across each category of participants (i.e., active HPAs, retired HPAs, support personnel, or performance partners). Themes were refined and then defined. Themes were used to organize the composite personas. Each persona was used to depict the perspective, experience, emotions, and expression of thoughts from the category of participants. Within each category, certain commonalities of experiences were grouped together to outline feelings, relationships, beliefs, and actions. The participants' transcripts were used to create the narrative component of each persona. For example, if a participant disclosed experiencing fear, or worry, their persona would use their words verbatim to express the feelings they explained. The researcher would only add filler words to connect sentences. Interpretations were made to connect thoughts, and experiences. Nine personas were constructed: three for active HPAs, two for retired HPAs, two for support personnel, and two for performance partners

(see Appendix G). The personas provided in-depth insight into the end-users' perspectives and experiences. These insights were actionable steps in better framing the problem.

Phase: Ideate

The purpose of the next phase was to facilitate collaboration with end-users and incubate solution-driven creations (Bazzano et al., 2017). During this phase, two co-design sessions were facilitated through the online platforms of Zoom and Mural to foster an environment for end-users to collectively brainstorm a wide array of solution-driven ideas through Design Thinking activities (see Appendix H for a thorough session outline). Steps taken during this phase were designed to answer research question 3: How might sport members collaborate and design a tool to support athlete retirement gaps? Notably, as mentioned above, the previous phases resulted in refining how the problem was framed, but not fully defined. As a result, some overlap from the defining phase continued during the ideation phase.

Ideate Phase: Participant Recruitment. Participant recruitment for this phase consisted of the same steps followed during the Define phase. The same recruitment text (see Appendix D) was emailed to new members with diverse roles across the sport system from the top, middle, and low Game Plan usage charts established during the Empathy phase. The researcher sought to gain participation from two members of each sport category to aim for saturation. Of the 50 emails sent, 15 new participants agreed to participate in a one-time co-design session. Prior to participating in the co-design session, all 15 participants signed a consent form (see Appendix E).

Ideate Phase: Data Generation. Data generation during this phase of the research study consisted of audio and video recordings, as well as virtual sticky notes posted on the virtual platform, Mural. The participants engaged in one of two three-hour co-design sessions held

virtually during the months of July and August 2022. Participants joined from Alberta, British Columbia, Ontario, Nova Scotia, Quebec, and Saskatchewan. The first co-design session consisted of eight participants, including two retired HPAs, two support personnel, and four performance partners. The second session consisted of seven participants, including one retired athlete, three support personnel, and three performance partners. The participants were led through a four-step brainstorm cluster activity documented on the collaborative online platform Mural to collectively refine the problem statement and begin generating solutions.

The co-design sessions began with all co-designers logging onto Zoom. Each attendee introduced themselves by sharing their name, province of residence, and their current and former (if applicable) role held in the Canadian high-performance sport system. Participants were then provided a summary of the previous research steps taken and were shown the 9 personas (i.e., three active HPA, two retired HPA, two support personnel, and two performance partners). After receiving an opportunity to review each persona, participants were guided through their first brainstorm cluster exercise on the virtual platform Mural.

The brainstorm cluster exercise is a four-step process adopted by Osborn (1957) that encourages participants to empathize and understand the diverse experiences and perspectives of other end-users to generate high volume ideas that meet the needs of end-users' problems. The four steps are as follows: 1) review the persona to learn about the specific end-user, 2) identify perceived pain points relating to athlete retirement mechanisms, 3) collectively cluster relevant sticky notes, and 4) collaboratively create a succinct title for each cluster.

Participants were first shown the personas generated in the previous define phase to further familiarize themselves with the athlete retirement landscape. As end-users who are currently integrated in the sport landscape, each participant brings their own perspective and

experience to the co-design sessions. As a participatory study, end-users are encouraged to lean on their unique point of view cultivated from their own experiences to support how they perceive each persona. When reading each persona, participants are encouraged to use a sticky note to identify the pain points they perceive are experienced by the individual(s) who are representing the personas. Identifying the pain points is an exercise used to refine and define the specific problems faced by a diverse sample of end-users.

Once all members concluded their brainstorming, participants were encouraged to review their peers' sticky notes and work together to cluster sticky notes that share relevant themes. During this time, participants were encouraged to ask questions regarding sticky notes, provide explanations or examples, and even reflect out loud on their personal experiences with their peers. Conversations in this matter can further promote creativity and refined brainstorming (Osborn, 1957). Finally, participants were instructed to create overarching titles that accurately represented their generated persona cluster's themes.

Participants in each group were guided to utilize the cluster steps for every category of personas provided (i.e., active athlete, retired athlete, support personnel, and performance partners). Once overarching themes were listed for each persona, co-designers engaged in step 3 (i.e., work as a team to cluster relevant sticky notes) and step 4 (i.e., collaboratively create a succinct title for each cluster) to establish overarching themes representing all members of the sport system. Through the Mural virtual platform, participants shared their thoughts and ideas by posting sticky notes on the Mural platform after each step. Corresponding steps for the cluster activity are further explored in Article 3.

Clustering the personas into themes was a process that took approximately 75 minutes. Participants were given a 10-minute break prior to progressing to the ideate phase. After

participants returned from the break, participants were instructed to transform their generated clustered theme titles into a “how might we” question (HMW). HMW is a question seeking to answer a previously identified theme. Creating a HMW from each cluster theme can foster inspiration and generate solution-driven ideas (Gottlieb et al., 2017). For example, if a theme cluster title was listed as “HPAs' access to food,” a HMW can be written as “how might we improve HPAs' access to food?” This process of transforming themes into a HMW initiates the ideation phase where end-users are now aware of the specific problem and begin taking actionable steps to explore solutions (Kelley & Kelley, 2013). Once all HMW statements were posted on Mural, participants engaged in dot voting (Dalton, 2018) to identify which HMW statement they perceived best met the criteria of guiding a feasible, practical, and viable prototype (Hasso Plattner Institute of Design, 2023). To vote, participants used their computer mouse to note a dot near the virtual HMW sticky note. Two HMW statements with the most votes progressed to phase 4. This predetermined number was established by the researcher to ensure progression was made during the co-design session within the three-hour allocated time slot.

Phase: Prototype

By this phase, co-designers defined the problem, generated ideas on how to formulate a solution, and were well positioned to begin designing prototypes. Co-designers generate and refine prototypes to address the athlete retirement problems. This process begins by brainstorming responses to established HMW and utilizes step 3 (i.e., work as a team to cluster relevant sticky notes) and step 4 (i.e., collaboratively create a succinct title for each cluster) of the cluster brainstorming exercise steps to design a feasible and practical prototype. For example, for a HMW such as “how might we improve HPAs' access to food?”, participants will

brainstorm solution-driven prototypes that seek to solve the HMW, and then they cluster similarities and title the prototype.

Prototype: Data Generation. During this phase, data were collected in the form of sticky notes, as well as video and audio recordings. Co-designers were instructed to use their sticky notes to list as many practical and actionable solutions to the curated HMW as possible. Once all members concluded their personal brainstorming, participants were encouraged to review their peers' sticky notes and begin collectively clustering relevant sticky notes together. Co-designers then progressed to identifying titles for each cluster. During this phase, co-designers engaged in dialogue to question, validate, or disagree with specific sticky notes; seek guidance in word choices; and share their personal values and experiences. Participants then re-engaged with dot voting (Dalton, 2018) to select their perception of the most feasible, sustainable, and impactful prototype for each of the two HMW. After many discussions and reflections on HMW, organizing clusters of sticky notes, and dot voting, co-designers were able to curate practical, actionable, and solution-driven prototypes that would meet the needs of end-users seeking to reduce athlete retirement barriers.

Phase: Test

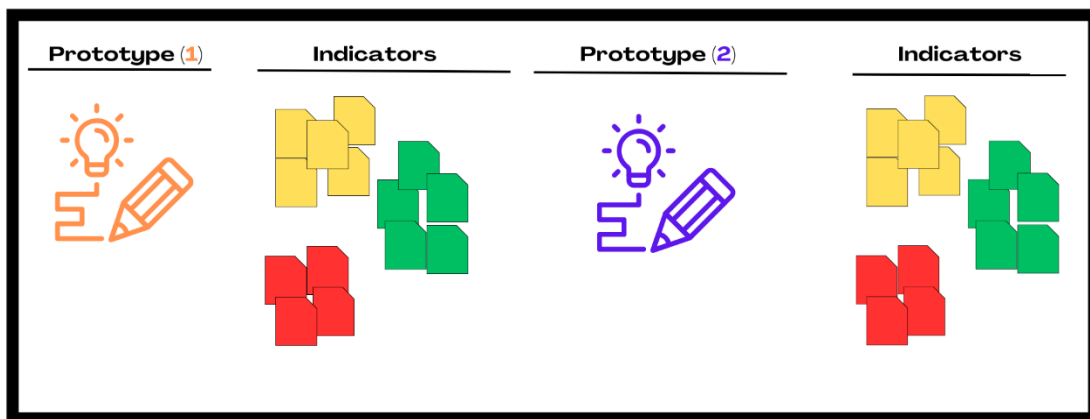
During phase 5, co-designers reviewed and evaluated the quality of the designed prototypes by assessing each prototype's risks, opportunities, and indicators for success. Adopted from a strengths, weaknesses, opportunities, and threats (SWOT) analysis, this form of analysis is used to assess the practicality, feasibility, and potential impact of each prototype (Helms & Nixon, 2010). As end-users of the prototypes, co-designers are best suited to provide insight on how prototypes can be integrated or adopted within their context and across the sport system. End-users who have extensive experience in their respective roles are also best suited to reflect

and consider anticipated indicators for success, opportunities, or risks. The final 45 minutes of the co-design session was allocated for testing the prototypes. The researcher anticipated that this process would take only 30 minutes; however, as an iterative process, the researcher left additional time in case more time was needed to revise or revisit previous phases.

Test: Data Generation. The video and audio recordings and the sticky notes on Mural were the collected forms of data during this phase. Participants were encouraged to reflect on their personal roles held in the sport system to assess the indicators for success, opportunities, and risks for each prototype. Participants were encouraged to list their indicators for success with yellow sticky notes, opportunities with green sticky notes, and risks with red sticky notes.

Figure 5.

Indicators for Success, Opportunities, and Risks



Note. Co-designers brainstormed indicators for success, opportunities, and risks for each prototype. Participants were encouraged to list their indicators for success with yellow sticky notes, opportunities with green sticky notes, and risks with red sticky notes.

Participants were encouraged to engage in discussion to provide further insight into their reasoning, to ask questions, and to share comments on others' ideas.

Ideate, Prototype, & Test: Data Analysis. During the ideation, prototype, and test phase, a latent semantic analysis (Landauer et al., 1998) was conducted collaboratively during the co-design sessions. The researcher and co-designers used a semantic analysis to extract meaning and value information from sticky notes to reflect human forms of innovation (Landauer & Dumais, 1998). This form of analysis followed two steps that were integrated in the cluster exercises: 1) implement a categorical matrix to organize the data and 2) conduct a singular value decomposition to reduce the dimensions of the set (Landauer et al., 1998). The first step was consisted of participants familiarizing themselves with the personas. Second, participants created clusters from the sticky notes generated from co-designers.

Participants engaged in ongoing cluster exercises to create, discuss, and organize data into relevant themes to propel each phase into the next. Additionally, dot voting (Dalton, 2018) was used to support the selection progress of HMW statements and prototypes. As a group, co-designers analyzed themes from the personas, generated categorical and collective persona cluster themes, curated each HMW, generated prototypes from HMW responses, and assessed the opportunities for risks towards and indicators of success for each design prototype.

Research Quality

This sport psychology qualitative study consisted of various steps and parameters to support the validity of this research study and to enhance the transferability of results (Tracy, 2010). An overarching relativist approach was followed and implemented to guide the outline, goals, and criteria selection used in this research (Burke, 2016). The researcher engaged and utilized journaling, one bracket interview, and critical friends. Additionally, the following list of

criteria was employed to support the research quality of this project: substantive contribution, research width, and credibility to enhance the quality of this research (Burke, 2016). Substantive contribution was considered when outlining the goals, outline, and social context and population of this research (Burke, 2016). This research contained goals to advance athlete retirement support for Canadian HPAs. Resultantly, relationships were established and interviews and co-design sessions were conducted with members in the high-performance sport context, such as former and current HPAs, sport performance support personnel, and sport performance partners.

Research width was pursued through various forms of in-depth data generation with a wide range of sport members to gain a comprehensive understanding of the landscape. The researcher immersed herself in the sport environment through meetings and informal conversations with sport members, she engaged in formal semi-structured empathy interviews, she facilitated co-design sessions with sport members who held various roles across the country, and she collaborated with other researchers who were conducting athlete retirement research studies within the Canadian high-performance sport system such as researchers from Game Plan and Université de Sherbrooke.

The final measures of credibility and transparency were heavily prioritized elements in this research study. The researcher confided in three critical friends throughout the research outline and analytical process to gather insight, encourage reflection, and provide guidance (Smith & McGannon, 2018). From the three critical friends, two were integrated within the academic field of sport psychology and the other was well immersed in Design Thinking. The researcher kept a journal to organize her thoughts and research progress to support self-monitoring over the four years of her doctoral program. The researcher also engaged in a bracketing interview (McNarry et al., 2019) as a reflective exercise to gain awareness of

preconceptions and how the researcher's own personal experience retiring from collegiate sport may have influenced the knowledge construction of this research project prior to constructing the interview guides used to collect data (Rolls & Relf, 2006).

Results

The results from this research project were presented in three articles. Each article corresponds to one of the three research questions outlined in Chapter 2. Guided by research question 1 (i.e., How are HPAs utilizing and accessing retirement support?), Article 1 presents insight regarding active and retired HPAs' usage of Game Plan's resources. The data sample includes a usage report outlining the use of Game Plan's resources from the years 2019 to 2021. This article was published as a blog in *Sport Research Insights and Articles* in May 2023 (see Hassan et al., 2023). The format used for Article 1 is adopted by the blog where this was published. The targeted audience of this blog is active sport members, as such this blog omits detailed research findings. The findings from the secondary data analysis are presented above.

Article 2 was guided by research question 2 (i.e., What are sport members' assessment, understanding, and perceived gaps of athlete retirement resources?). In Article 2, an organizational exploration was conducted to examine sport members' perception and understanding of athlete retirement support mechanisms. This sample includes interviews with 19 members across the high-performance sport system. Article 2 has been submitted to the *Qualitative Research in Sport, Exercise, and Health Journal* for peer review.

Accordingly, Article 3 was guided by research question 3 (i.e., How might sport members collaborate and design a tool to support athlete retirement gaps?). In Article 3, the process and outcome of sport members co-designing a prototype to advance forms of athlete retirement support was presented. Data includes two co-design sessions with a total of 15 participants who held various roles in the sport system. Article 3 has been submitted to the *Journal of Applied Sport Psychology* for peer review.

Article One - Blog

Hassan, I., Seguin, C. M., & Culver, D. M. (2023). Canadian high-performance athletes' use of retirement resources. *The Sport Information Resource Centre: SIRCircuit articles*.
<https://sirc.ca/blog/canadian-high-performance-athletes-retirement-resources/>

Earning a roster position as a nationally carded athlete is no easy task (“carding” refers to financial assistance from Sport Canada’s Athlete Assistance Program). Athletes spend years working on their craft to represent Canada on the international stage. The length of time spent in the role as a national athlete varies across sports and between athletes, however, one commonality is every athlete’s inevitable retirement from sport. For some, the exit from sport is voluntary, while others may retire involuntarily due to roster deselection, injury, or life circumstances.

Athlete retirement has been associated with numerous psychological, social, physiological and emotional consequences. Recent research suggests that high performance athletes (HPA) should proactively prepare for life after sport by engaging with and maintaining a sport-life balance. Athletes can work towards this by investing in areas of their life outside of sport such as education and family, as well as financial, social and professional development. Engaging in practices that promote a sport-life balance does not imply an athlete should decrease their focus or commitment towards their pursuit of sport excellence. Rather, the concept of balance positions the athlete to have higher life satisfaction while perceiving positive sport experiences as they train for excellence (Alfermann et al., 2004; Lavalley 2019).

Game Plan offers free support for carded Canadian athletes to foster an improved sport-life balance, optimize sport performance, and assist with planning for athletes’ post-sport career. Available to active and retired athletes, Game Plan’s resources include education, career, community, skill development and health support. Despite the curation of world-class retirement support, Game Plan’s resources are underutilized. The reason for this remains unclear.

After over a decade of servicing Canadian athletes, the researcher examined Game Plan's usage data from 2019-2021 to garner an understanding of how active and retired athletes in national sport organizations (NSOs) use Game Plan's resources. The data outlined Game Plan's usage rate from the following services domains: career, education, health, education, networking, skill development and other. All users were listed as unidentifiable randomized codes that solely indicated their NSO affiliation and the year and frequency in which specific resources were accessed.

From the years 2019-2021 a total of 1986 athletes utilized their resources. 26.6% of the usage occurred in 2019, 42.9% occurred in 2020, 29.5% occurred in 2021 and 1.1% was reported as unknown. Game Plan totalled 8579 interactions with athletes. 53.1% of which were through one-on-one interactions and 46.9% were in the form of group events. Notable discrepancies were reported in the use of Winter (27.3%) and Summer (65.2%) athletes, as well as athletes competing in Para (14.9%) and Non Para (75.5%) sport.

This blog provides insight to how Game Plan's resources are being utilized by athletes across the sport system and identifies barriers athletes face in accessing Game Plan's support for their proactive and reactive retirement needs.

Internal barriers and resource usage

A recent article examined Canadian athletes' ability to plan and prepare for their retirement (Brassard et al., 2022). The authors identified 3 environmental styles fostered by coaches, support staff, and high-performance directors that influence an athletes' ability to plan and prepare for retirement:

- An enabling environment empowers athletes to take action to plan and prepare for retirement
 - For example, athletes feel encouraged and supported to pursue external interests such as school, work, or family advancements
- A restricting environment has factors that may make it difficult to act
 - For example, athletes have limited autonomy in their preparation and feel discouraged from pursuing external interests due to fear of being viewed as “less committed”
- A hindering environment may impede an athlete from acting
 - For example, athletes are actively discouraged to pursue external interests such as school, work, and or family advancement and are unable to plan or prepare without anticipated consequences

Within these cultures, athletes experience internal barriers such as a lack of support for activities outside of sport (such as academics, work, or family) from coaches, and limited opportunities provided by NSOs to prepare for career transitions.

Beyond these internal barriers, Game Plan usage discrepancies between mainstream and Para athletes indicate there may be other contributing factors. Based on the usage data from 2019 to 2021, able-bodied athletes are accessing Game Plan resources more than Para athletes. Factors like retirement age (for example, mainstream athletes often retire earlier than Para athletes), athletic identity around retirement (for example, self-esteem scores have been reported as lower in Para athletes who retired involuntarily when compared to those who retired voluntarily), and narratives around the topic of retirement (Guerrero & Martin, 2018; Marin-Urquiza et al., 2018) may be some of these contributing factors.

How funding influences access

NSOs are non-profit organizations that rely on various forms of funding to support sport advancement in Canada. Most NSOs rely on the Government of Canada, membership fees, and other organizations to provide financial support, such as the Canadian Olympic Committee and the Canadian Paralympic Committee. In addition, some organizations receive targeted high-performance funding from the Government of Canada, the Canadian Olympic Committee, and the Canadian Paralympic Committee based on recommendations from Own the Podium to advance the performance potential of athletes through funding staff, coaches, access to competitions, and organizational facilities. Own the Podium assesses the performance potential of each sport organization and provides funding recommendations to support the organizations' athletic success.

Predictably, there are funding disparities across sport organizations due to different performance potential measurements. However, there appears to be a trickle-down effect regarding how funding influences athletes' access to Game Plan resources. For example, the Game Plan usage data showed high athlete usage from athletes in higher funded sport organizations when compared to athletes in lower funded organizations.

Regardless of sport organization funding, all carded athletes have access to free Game Plan support. However, this latter group of athletes appears to be missing out on opportunities to proactively and reactively receive support to prepare for and adapt to life after sport.

One leads to another

Among the thousands of athletes who utilized Game Plan's support, the vast majority accessed Game Plan's resources on multiple occasions, and at times, for various forms of support, including health, education, community, career or skill development. This widespread repeat usage emphasizes the importance of initiating that first meeting with a Game Plan advisor.

In order for an athlete to engage in proactive preparation for retirement, communication on the why, where, and how of a positive sport-life balance becomes pivotal. The first meeting with a Game Plan advisor is designed towards addressing the aforementioned questions. NSOs can do a great deal for their athletes by facilitating that initial engagement. As such, organizations can do the following to support an athlete in getting to that initial meeting:

1. Familiarization

- Ensure members within your sport organization are aware of the informative resources available, how to access them, and when to refer
 - This can be done by hosting an annual information session where staff and athletes are provided with information and documents they can refer to

2. Lean on the experts

- Collaborate with Game Plan advisors to identify ideal times to facilitate formal and consistent information sessions for your athletes and staff

3. Invest in sustainability

- Identify strategies and practices that members within your organization can exercise to foster an enabling environment for athletes to plan and prepare for their retirement
 - This can be done by encouraging, supporting, and celebrating athletes' external interests and pursuits

Figure 1: Considerations and Strategies for Sport Organizations Seeking to Improve Athlete Engagement in Game Plan Resources



Notes: This figure outlines the various elements NSOs should consider when seeking to facilitate an environment that enables athletes' to prepare for retirement. Each element promotes an athlete's sport-life balance by positioning the athlete to the development elements of themselves before their performance.

Conclusion

It can be incredibly difficult to predict the length of time an athlete will spend training and competing in their sport, the injuries and triumphs they may endure, the levels of success they will achieve, or the exact moment and reason that will lead them to retire. Sport organizations in Canada have made vast improvements to provide athletes with holistic forms of support that address athletes' technical and tactical performance, as well as their strength, conditioning, mental, nutritional and physical performance. Now, progress is needed to minimize barriers athletes experience to accessing proactive and reactive retirement support. With the abundance

of athlete retirement research studies that highlight the mental, emotional, social, professional, and physical challenges athletes face due to their lack of retirement preparation, change in how sport organizations perceive, promote, and prioritize retirement is necessary.

Article Two

Facilitating or Complicating Canadian Athletes' Ability to Prepare for Life After Sport?

An Ecological Perspective

Abstract

In this study, Canadian sport members' understanding, and perception of athlete retirement support mechanisms were explored to better comprehend athletes' willingness and ability to prepare for retirement. Semi-structured empathy interviews were conducted with 19 members across the high-performance sport system including active and retired Olympians and Paralympians, support personnel, and performance partners. An analysis of diverse perspectives led to three themes: (a) high-performance sport members have limited knowledge and understanding of retirement resources, (b) a sport organization's culture can present barriers or facilitators through direct and indirect messages to athletes, and (c) athletes who proactively sought out retirement support or a sport life balance experienced fewer challenges transitioning. Participants' perspectives are presented in composite personas to summarize the experience and needs of specific roles across the broader sport system. Results from this study reveal the contextual factors and collective effort support personnel and performance partners required to minimize the barriers athletes face in accessing and engaging with retirement support mechanisms.

Keywords: athlete transitions, sport-life balance, sport culture, Game plan

Sport retirement is an inevitable part of every athlete's career. Upon retirement, high-performance athletes (HPAs) enter a transitional phase during which they must move away from a life centered around athletics (Wylleman et al., 2004). This transition can bring physiological, social, emotional, and psychological challenges (Clemmet et al., 2012; Stambulova & Wylleman, 2014); including depression, loneliness, low-self-esteem (Wylleman et al., 2020); alcoholism and substance abuse; eating disorders; identity confusion; low confidence; and, in worst cases, an attempt at or death by suicide (Gouttebarga et al., 2017; Lavalley et al., 2000). To minimize these

challenges, scholars have suggested HPAs should engage in proactive retirement measures such as post-athletic career planning or establishing, developing, and strengthening elements of themselves beyond their athlete performance prior to retiring from high-performance sport (Kuttel, 2017; Stambulova, 2012). Game Plan is a third-party athlete wellness program that seeks to equip athletes with tools to stay in sport longer, perform better, and more relevantly, retire healthier (Game Plan, 2023). Game Plan's resources are free of charge to funded Canadian HPAs, yet only 36% of carded athletes utilized these resources in 2019 (Brassard et al., 2022). Athletes who engage in pre-retirement planning face fewer challenges adapting to life after sport; however, many HPAs face barriers that make it difficult to engage in pre-retirement planning (Fuller, 2014; Kuttel et al., 2017). The low rate of resource utilization in Canada suggests a need to explore sport members' understanding and perception of athlete retirement mechanisms to comprehend athletes' willingness and ability to engage with retirement support.

The conceptual model of adaptation to retirement among athletes developed by Taylor and Ogilvie (1994) provides a rich conceptualization of athlete retirement. This framework guided the theoretical foundation of this study as it identifies influential elements affecting athlete retirement, including how and when retirement was initiated (e.g., voluntarily or involuntarily), the performance culture within one's sport environment, what resources the athlete had access to, and how the athlete responds during their retirement. While some debate about who is responsible for proactively preparing an HPA for retirement (Miller & Buttell, 2018; Singer, 2005), Knights et al. (2019) found certain conditions enable athletes to flourish in their retirement preparation; organizational support was identified as an essential factor.

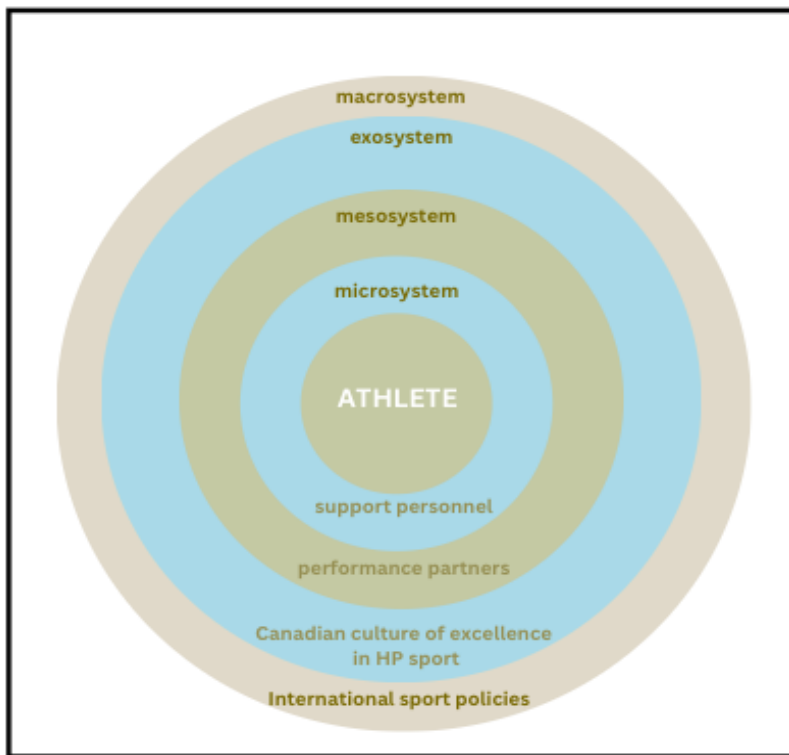
Recently, Brassard et al. (2022) demonstrated factors beyond an athlete's control that significantly influence athletes' sport-life balance and preparedness for retirement. After

interviewing 14 Canadian HPAs, Brassard et al., (2022) found coaches have a crucial role in athletes' access to proactive preparation as coaches either enable, restrict, or hinder an athlete's capability to plan and prepare for athletic retirement. Their findings provide insight into HPAs' perspectives of the sport environments and how these environments influence athletes' willingness to prepare for retirement. However, insight from retired athletes, support personnel, and performance partners is lacking, which skews our understanding of the broader contextual factors and impact these may have on athletes' ability to access retirement support. This research addresses this gap by exploring various perspectives across the ecological system of sport.

The ecological system's theory (EST) by Bronfenbrenner (1977; 1979) conceptualizes human development and considers the changing influences within a large system. The Canadian high-performance sport system accounts for micro (i.e., first layer; direct contact), meso (i.e., second layer; secondary contact), exo (i.e., third layer; environmental contact), and marco (i.e., international sport policies) systems; each uniquely influences human development (Bronfenbrenner, 1977).

Figure 1.

Canadian Sport Ecological System



Note. The above illustration is adopted from Bronfenbrenner's ecological system's theory (1977; 1979) to showcase the roles and relationships of members in the Canadian high-performance sport system.

The micro layer consists of sport performance support personnel (e.g., coaches, athletic therapists, managers, mental performance consultants, strength and conditioning coaches, etc.) who work directly with athletes and share a responsibility for supporting athletes' development and well-being (Bronfenbrenner (1977; 1979; Stirling & Kerr, 2013). The meso layer comprises authority performance partners who make decisions, oversee, and support national organizations (Fletcher & Arnold, 2011). The exo layer consists of the culture of the Canadian sport system. Though members do not actively participate in this layer, their actions and behaviors that form

and uphold the culture are shown to have a profound influence on athletes' development and sport experience (Fletcher & Arnold, 2011).

Within this ecological structure, power imbalances exist as athletes report to support personnel, who, in turn, report to the performance partners (Fletcher & Arnold, 2011). Therefore, this structure provides a conceptual understanding of each role's contribution (i.e., athletes, support personnel, and performance partners) in framing and upholding the culture within sport organizations; the exosystem. Presently, sports members' understanding and perception of retirement support mechanisms remain unknown (Brassard et al., 2022). In line with the research purpose, this study aims to understand why the various forms of HPA retirement support in Canada are utilized at a rate of only 36% (Game Plan, 2023).

Canadian Sport System

Canada has roughly 95 high-performance sports that are home to athletes competing in the Paralympic, Olympic, Pan Am, or Para Pan Am disciplines (Canadian Olympic Committee, 2021). Each sport is governed by its respective national sport organization (NSO) to establish its culture, rules and regulations, training programs, support personnel, athletes, and funding. Own the Podium is a not-for-profit organization that assesses the performance potential for NSOs and provides funding recommendations to government funding parties (Own the Podium, 2022). From this funding, NSOs can pay for performance elements like personnel wages, training facilities, equipment, travel, and competition. Select athletes called 'carded athletes' receive funding based on performance from the Canadian Athlete Assistant Program. Carded athletes receive access to resources, facilities, and personnel to support their performance, well-being, and gain access to training environments as well as strength and conditioning,

fitness/physiological, mental performance, mental health, nutrition, physical therapy, and medical support.

In 2010, Game Plan, the Canadian athlete wellness program, was launched to support HPAs' success in sport and life through a holistic wellness approach in collaboration with the Canadian Olympic Committee, the Canadian Paralympic Committee, Sport Canada, and the Canadian Olympic and Paralympic Sport Institute Network. This program allows all carded athletes free access to career advice, education, networking, health services, skill development, and other resources to improve life-sport balance, sport performance optimization, and post-sport career planning. Resource access is granted the moment an athlete is carded and remains active until two years after retirement. Despite this free proactive and reactive retirement support, nearly two thirds of athletes do not use Game Plan's resources (Game Plan, 2023).

Knowledge dissemination of Game Plan's resources within NSOs is unclear, and sport members' general knowledge and awareness of Game Plan's resources are unknown. Additionally, it is unclear how sport members are informed about Game Plan's resources, and more specifically, what access barriers and facilitators are involved. To address these gaps, this research's purpose was to explore active and retired athletes, support personnel, and performance partners' understanding and perception of athlete retirement mechanisms to understand athletes' ability to engage with retirement support. This exploratory study used narrative inquiry to document sport members' experiences including active athletes, retired athletes, athlete-facing support personnel (e.g., coaches, strength and conditioning coaches, athletic trainers, mental performance consultants, etc.), and third-party sport performance partners to answer the following research questions: (a) What are sport members' understanding and perceived gaps related to athlete

retirement resources? and (b) How do sport members' understanding of athlete retirement resources influence athletes' ability to utilize retirement support?

Methodology and Methods

The narrative inquiry approach is in line with interpretivist assumptions within a participatory paradigm. This narrative inquiry approach considers that the social construct of knowledge is facilitated through language, consciousness, and shared meaning (Smith & Sparkes, 2009). As a pathway to narrative inquiry, certain Design Thinking methodologies were used to achieve our research goals. More specifically, the use of empathy interviews to support the creation of personas (Nelsestuen & Smith, 2020). The foundation of this inquiry lies in information from narrated stories (Smith & Sparks, 2009) presented in the form of personas to support the connection between the reader and the participants' experience (Nielsen, 2013).

The researchers used the findings from the empathy interviews to construct the composite personas. Personas are fictional characters that succinctly reflect specific populations, roles, or ideas within a large system (Ferreira et al., 2015). Personas can be constructed through observations, empathy interviews, or secondary data collected to elicit empathy of readers through the raw demonstration of participants' needs and experiences (Gasparini, 2015). Through creative narrative approaches, researchers can highlight nuances beyond the data's findings. For example, the analysis and dissemination of results can include evocative narratives related to the research question. The purpose of personas within the Design Thinking methodology is to evoke empathy for readers and change makers (Nielsen, 2013).

Researcher Positionality

Ontologically speaking, the underpinning of the narrative inquiry approach rests in the shared dialogue with participants, interpersonal agreement, and consistent reflection on the self (i.e., researcher), research steps, and decisions, including those related to rigour (Sparkes & Smith, 2009). The first author engaged in a reflective bracketing interview to gain awareness of her preconceptions and how her experiences as a support person (e.g., mental performance consultant) and a former HPA influence her knowledge construction (McNarry et al., 2019). The first author also engaged in critical discussions with the second author (i.e., a mental performance consultant, coach, and retired HPA), allowing for conversations surrounding fairness, appropriateness, and the believability of findings (Burke, 2016). The epistemological foundation relies on and values the belief that participants' insider knowledge is acquired from their experiences in social conditions. It is assumed that knowledge is co-created within this participatory paradigm. The quality of logic was exercised through the reflective inductive analysis and participants' experiences across the sport system and narrated through personas (Smith, 2017). Finally, transparency and credibility were established through a bracketing interview, reflective conversations, member reflections, and the descriptions of sport system members' detailed personas.

Participants

Criterion sampling (Higginbottom, 2004) was used to recruit 19 participants from one of the following groups: (a) active carded athletes (b) retired athletes who competed in the Tokyo Olympic or Paralympic games, (c) active support personnel working with HPAs in the daily training environment, and (d) performance partners involved in high-performance sport. Retired athletes were interviewed within the 18-month retirement timeframe, capturing a period when athletes are most susceptible to transition-related challenges (Stephan et al., 2003). This time frame also meant that retired athletes still had access to Game Plan resources. This allowed for

an in-depth exploration of their retirement, experiences, needs, and efforts using Game Plan support (Game Plan, 2023).

The sample represented five provinces across the country. Out of the 19 participants, four of them were active athletes, four were retired athletes, five were support personnel (i.e., athletic trainers, coaches, and a mental performance consultant), and six performance partners from the Canadian Olympic and Paralympic Committees, Game Plan, and Own the Podium.

Data Collection

The interviews ranged from 48 – 65 minutes (average = 53 mins). The 19 participants' average age was 32 years, and they reported the following demographics: (73%) White, (21%) Black, and (5%) East Asian. Furthermore, the participants were from two Para sports and six non-Para sports. Ethical approval for this study was obtained from the researchers' university Office of Research Ethics and Integrity. Consistent with the philosophy of narrative inquiry, empathy interviews were chosen to elicit stories containing feelings, beliefs, experiences, and desires using open-ended questions, exploring participants' thoughts, feelings, desires, and retirement needs (Gasparini, 2015; Nelsestuen & Smith, 2020). The participants engaged in one empathy semi-structured interview held virtually using the university's Zoom license. They were asked about their experiences in the sport system, their understanding of the retirement resources available, access and relationship to resources, experience with athlete retirement, and needs within the athlete retirement landscape. The confidentiality of all participants was protected by codes. The interviews were recorded and transcribed. Minor revisions were made to the transcripts when reviewing the audio files for accuracy by the first author, and the transcripts were sent to the participants for review; no requests for changes were made.

Data Analysis

Data were analyzed according to the guidelines of a thematic analysis (Braun & Clarke, 2006, 2021) and the persona approach (Nielsen, 2013). The researchers acknowledge a reflective approach is a unique process as the findings are entirely subjective to the researchers' experiences. Additionally, the researchers believed that exploring participants' personal experiences would provide meaningful, collective accounts related to sport members' experience with athlete retirement support mechanisms.

Data were reviewed by evaluating interview transcripts and listening to the corresponding audio. The researchers then established broad ideas, themes, and established categories for each participant group (active athlete, retired athlete, support personnel, or performance partner). The themes were revised according to personal reflections and they were collapsed or expanded, and then defined. This process allowed for the narratives, voices, and storylines of the participants to be shared through personas. Finally, a composite persona was constructed through the persona approach (Nielsen, 2013) to depict the experiences of each participant role. Presenting lived experiences in the form of personas succinctly outlined participants' problems and needs, while invoking the emotional empathy necessary to foster creativity and innovation with readers and change makers (Gasparini, 2015). The personas portray individual and collective units of meaning; expressions of thought, emotions, and experiences; and the contexts surrounding participants' realities.

Results

The following themes were developed through the data analysis: a) members across the high-performance sport system have limited knowledge and understanding of accessible

retirement resources, b) cultures within sport organizations send direct and indirect messages to athletes that act as barriers to proactive retirement support, and c) athletes who proactively sought out support or a sport life balance experienced fewer challenges with their transition. To gain a landscape understanding of the relationships, needs, and experiences of various individuals, themes were described from each type of the participant represented in the study, including the active athlete, retired athlete, support personnel, and performance partner participants.

Active Athletes

Following interviews with four active athletes in the Canadian sport system, two personas were created Aysha and Aaron. Both carded and competing in different sports at either the Olympic or Paralympic Games, they had dramatically different experiences with retirement resources. Various internal and external factors are shown to influence their sport-life balance, and their relationship to and understanding of available retirement resources.

Aysha: An Active Athlete

Aysha earned her carding and was officially granted access to performance support following the completion of her undergraduate studies. Despite starting her sport as a youth, Aysha did not think she could make the national team. After receiving an invitation to the national training camp, she gained the opportunity to compete internationally. Afterwards, she was selected to represent Canada and quickly gained success: “within a matter of months [from starting training camp,] I was competing in international competitions.” However, when she had downtime during the pandemic, she realized she “wanted to start a family soon” due to her age, which became more important than “being on the national team.”

Aysha learned about the centralized sport culture and standards within her sport organization as athletes had to live in one location to train daily. Very few athletes were engaged in external commitments such as parenting, academics, or work.

Aysha was introduced to Game Plan's resources after being carded as "[she] got the nudge, a lot, to Game Plan's resources—not from [her] coaches, but from emails from Game Plan. The coaches didn't worry about it, ... and they never had any conversations about anything outside of sport." Aysha found the emails informative in highlighting Game Plan's services. Notwithstanding this, she described barriers affecting her perception of resource accessibility and effectiveness. For one, the way sport-life balance and retirement preparation were discussed and not prioritized within her environment made it difficult for Aysha to access these services. Aysha affirmed the need for support personnel to "improve their understanding of athletes' end goals... [to] support us [both] as an athlete and a person in society... and that winning medals is the only thing ingrained into our [sport] culture, but [she affirmed that] people should be set up to avoid a crisis moment during the Olympic year." Aysha believes all athletes should access Game Plan's resources prior to attending the Olympic Games. However, she believes her sport organization has a non-existent relationship with Game Plan, which impacts proactive access.

The second barrier was the limited scope of available resources. Aysha sought out Game Plan's resources for a specific form of support: fertilization (IVF). Following a successful Tokyo Olympic debut, Aysha was eager to return to train for Paris 2024. Aysha learned that some of her older teammates tried IVF and postponed starting a family. She accessed Game Plan to learn more about IVF support. However, no forms of familial support were available. She felt disappointed as "IVF would [have] give[n her] peace of mind during training... IVF is so expensive for an amateur athlete to afford." She was unaware if she would regret her decision to

make a 2024 Olympic push without familial security, however, she affirmed that “every female athlete should have a conversation with their doctor when they enter the training center.” Aysha shared that she will likely retire following the Paris 2024 Olympic Games regardless of her results due to wanting children. While unsure if her decision to make a push for the Paris 2024 games will be worth it, she voiced a gender comparison:

The men can stick around for years. That’s just not realistic for women who want to start a family. It’s really too bad because in my sport, you tend to do better at your second or third [Olympic] games. It’s almost as if [the] women are robbed of the opportunity to compete if [they] want to be mothers, or even have careers.

The lack of support left Aysha in a dilemma: advance her career or familial goals, but not both.

Aaron: An Active Athlete

Like Aysha, Aaron was an active youth who competed in various sports. After becoming disabled as a teenager, Aaron attended a national training camp and earned a roster spot. Within Aaron’s sport organization, he perceived it as common for athletes to engage in external commitments outside of their sport like parenting, work, and school. Aaron stated he “remember[ed] the day [he] received [his academic] acceptance letter. All [his] coaches were supportive, happy, and proud.” Aaron learnt people within his organization had reciprocal relationships beyond their performance role.

Aaron worked with the support personnel to avoid conflicts with his academic and training schedule. Aaron integrated into the disability community within his university and attended social events. Following what Aaron described as a “disappointing showing” at the Tokyo Paralympic Games, Aaron withdrew from his studies to prepare for Worlds and the Paris

2024 Paralympic Games. Months after withdrawing from his program, Aaron “felt off” and sought support from Game Plan as he “went from being busy to having so much free time.” This left him feeling “lazy, unmotivated, and useless.” Aaron observed his teammates found great success in engaging in a sport-life balance with proactive retirement support from Game Plan’s networking and career-focused events, so Aaron contacted his regionally assigned Game Plan advisor to seek employment or volunteer opportunities. He felt as though “... many people needed help during the pandemic, but [he] was only focused on [his] sport.” Aaron wanted to get involved to nurture some skills and find an external commitment that could make an impact. However, Aaron was not offered any option to contribute. Instead, he found volunteer opportunities himself because “...everything Game Plan offered was business oriented or unrealistic for someone with a disability like [his].” Aaron remains optimistic for accessibility improvements. Currently, he has support from his support personnel and is confident he will slowly improve his sport-life balance.

Retired Athlete

Two personas: Ray and Rachel were developed following the analysis of the interviews with four retired athletes. The retired athletes anticipated retirement as they attended their final Games. However, their preparation and communication of their plans with their NSOs are vastly different.

Ray: A Retired Athlete

Following the 2016 Rio Olympic Games, Ray had a meeting with his support personnel informing them he would retire after the next Olympic cycle. As an organization, Ray’s support personnel created a four-year plan to optimize his performance and life after sport. Ray was able

to further his studies, obtain a part-time job, and purchase a home while training and competing with the national team. He stated he “superficially considered how the transition may affect [him], so [he] tried to use Game Plan’s resources,” especially resources like “mental health providers and performance coaches”; he also solicited support from “people within [his] inner circle.” Throughout Ray’s athletic career, he established a large social network. One part of his preparations consisted of reaching out to former athletes to learn from their experiences. Ray reviewed the emotional, mental, financial, geographical, and professional implications of retiring. One adjustment Ray found difficult was how he would spend his time. He stated, “as an athlete, life is finite” since “the shift from days spent training versus days spent on the computer is radically different.” He learnt “to reimagine what breaks look like... [as he] tried to explore interests outside of sport to try to incorporate them...”

Proactive exploration of personal interests was something Ray sought within the latter half of his career. He found himself engaging in his interests such as daily walks, intentional connections with friends and family, yoga, and camping. At the time of the interview, Ray was 11 months into his retirement following the Tokyo Olympics and was actively taking advantage of Game Plan’s post-career resources by seeking mental health support and financial advice. Despite not having immediate mental health concerns, he felt these resources would support adjusting to life without sport.

Rachel: A Retired Athlete

In a vastly different instance, Rachel perceived that her sport organization discouraged discussions about retirement or external commitments. Rachel recalls athletes being shamed and cut from rosters when engaging or expressing wanting to start a family, a job, or studies. Despite being aware of existing retirement support, Rachel remarked the following on access issues:

The fact that we have help from Game Plan and funding from Sport Canada is truly unreal. I'm happy with what Canada has to offer, but it's unfortunate that the coaches in these organizations have so much power to control what we can and can't use. You have to remember, representing your country is a dream, but when you make it, you don't want to lose your spot. Doing extra stuff outside of sport is a risk not many of us are willing to take.

Engaging in commitments outside of sport that could be beneficial for life after sport within Rachel's NSO was either avoided entirely by athletes or selectively discussed with trusted individuals. Rachel had entrepreneurial aspirations and planned for life after the Tokyo Olympics. In preparation, Rachel enrolled in courses and began a "soft business launch" before the Olympic Games. However, she "shared [her] plans and progress with a few trusted teammates" since she did not "want to give [her] coaches a reason to [remove her from] the Tokyo roster." Her fears were based on what she had seen happen in the past as she felt "they would have selected a younger player" to replace her.

Rachel felt anxious about being an active entrepreneur and an athlete. Although extra commitment enhanced her focus, rest, and productivity, Rachel was worried about her coaches finding out. Though Rachel discreetly prepared for her transition from an employment and personal development point of view, she was unprepared for the well-being challenges that would occur:

I made the decision to retire, but it was tough. I don't know what I was expecting, but it's upsetting how events took place. I walked off the plane [after the Olympics] and that was it. No one even reached out to me except when they needed me to sign the paperwork. It really makes you realize how little you mean to them. One minute I'm a player, and the

next minute, what am I? So, on connection and belonging, I belonged to that identity. I had a hard time resonating with my new identity... I struggled—am struggling—a little with substance abuse. I turned to multiple different substances to fill that dopamine void.

For Rachel, the retirement experience left a memory of a “lingering disappointment” which clouds her memory of being a national athlete.

Mentorship and networking were practices Rachel wishes she engaged in prior to retiring from sport. Rachel was secretive in her support seeking efforts to protect her athletic interests. She felt “a directory of all athletes who have retired to show where they are now” would have been helpful. Rachel did connect with retired athletes after her retirement, but she shared it would have allowed her to “contact them on [her] own” prior to retiring.

Ray and Rachel felt their sport organization influenced how accessible they perceived retirement support to be, as well as their ability and openness to prepare for their transition. Regarding RA1, he was open with his sport organization about his transition, which led to guided proactive support. However, RA2 did not trust how her sport organization would react, so she worked in isolation with fewer resources and internal support.

Support Personnel

Interviews were conducted with five support personnel: coaches, a mental performance consultant, and athletic trainers. Two support personnel personas were constructed: Sierra and Sylvan. Both personas provide insight into explaining their level of knowledge with athlete retirement support mechanisms.

Sierra: A Support Personnel

Sierra has been working within her centralized NSO for five years. When reflecting on her experiences, Sierra recalls being brought on board quickly as “they were urgently hiring... The onboarding was very relaxed and informal. [She] was expected to learn on the go.” When asked about athlete retirement within her organization, Sierra disclosed having little knowledge on whether retirement is a challenge for her athletes since they “would work to address that as an NSO if it was a problem.” Additionally, Sierra did not know whether “athletes [were] thinking about retirement or whether athletes want to be focused on the present.” Sierra questioned, “don’t the athletes have Game Plan for that?”.

Since Sierra disclosed having little to no knowledge of the specific resources Game Plan offers, how to access them, and the eligibility requirements for their resources, Sierra did not “feel comfortable endorsing them because [she does not] fully understand what Game Plan does.” She did recall an instance where “one athlete saw [Game Plan] for resume help”; however, she had no other knowledge about the services or which athletes were eligible to receive their support. Sierra concluded that “[she] will look [Game Plan] up...” “on [her] own...” Sierra wishes she learned about the systems and partners in place to support athletes when she was hired by her NSO. She concluded the interview by expressing gratitude as she was motivated to learn about retirement resources.

Sylvan: A *Support Personnel*

Similar to Sierra, Sylvan demonstrated limited knowledge regarding the resources available to athletes; however, Sylvan is aware of the difficult time athletes face when they voluntarily or involuntarily leave sport. Sylvan affirmed the importance of athlete-support personnel relationships and the need to positively affirm they “care for [athletes’] success in

sport and in life” beyond sport. Sylvan believes a strong athlete-support personnel relationship allows athletes to be “happier, more resilient and increases their [athletic] performance.”

Sylvan observed athletes tend to perform better at the Olympic Games once they have Olympic experience. Sylvan believes athletes must maintain a healthy sport-life balance and healthy athlete-coach relationship to allow for a sustainable career over multiple Olympic cycles. Sylvan shared that “athletes and coaches want medals, [but] athletes need to be healthy to get those medals.” Sylvan admitted he felt limited to a “short sleeve of suggestions” should an athlete ever show a poor sport-life balance; however, his perception has changed after learning more about Game Plan through the interview. Sylvan disclosed feeling embarrassed by his limited knowledge on the resources: “To be frank, I know very little about resources like Game Plan, and after this conversation, I will do my research.”

Both Sierra and Sylvan did not learn about the available resources during their onboarding process and neither took initiative to explore them. However, following the interviews, both Sierra and Sylvan appeared motivated to conduct an independent exploration of accessible resources; these interviews demonstrate support personnel would appreciate and benefit from receiving information on athlete retirement resources during their onboarding process or in a formal setting.

Performance Partners

The final layer in the Canadian sport system consists of performance partners. Interviews were conducted with 6 performance partners from the Canadian Olympic and Paralympic Committees, Game Plan, and Own the Podium. Two personas were created: Pam and Paul. Both

personas provide insight to performance partners' understanding and perception of athlete retirement barriers.

Pam: A Performance Partner

Pam has been working in the sport system for over a decade. She transitioned through various roles and has spent four years in her current role. She has observed gaps in how the sport system proactively and retroactively prepares and supports athletes for their retirement, such as bandwidth and funding metrics.

Pam explained that “some organizations are run by a full team with people who have paid salaries and given benefits, whereas others are run by two to three volunteers” resulting in budgetary constraints. Pam proceeded to share how funding disparities influence organizations' bandwidth to obtain and disseminate knowledge on retirement resources. Pam provided an example of the practices one organization engages in:

When I think about trailblazers in this topic, my first thought is [Sport X]. They have been intentional about creating opportunities for athletes to stay involved in their program once they have finished their careers as a national team athlete. They bring retired athletes in to run technical sessions, to be mentors to younger athletes, or even help facilitate their career and transition to being a coach or referee. There are some real intentional pieces there in terms of how they create a pathway for athletes to successfully exit out of their career and head into the next phase.

Pam highlighted this specific sport had received a substantial amount of funding based on the team's success in the past few Olympic and World cycles. However, Pam felt some well-funded sport organizations do insufficient work with athlete retirement due to where sport-life

balance and retirement fall on their organization's list of priorities. Pam affirmed "it is the responsibility of the NSO, funding agencies, or anyone high on the pyramid scheme to ensure athletes are prepared for their transition and receive support before and once they do transition." Furthermore, she added that although Game Plan "is athlete focused, there are not enough resources for NSOs on how to affect internal change... which demonstrates that Game Plan is a band-aid solution... since Game Plan cannot affect change on the whole sport system." Pam expressed concerns about Game Plan's limited impact potential from working only with athletes rather than working with all members in the sport system.

Paul: A Performance Partner

Similar targeted gaps and suggestions were identified by Paul who is six years into his role after concluding his careers as an athlete and coach. Paul engages in consistent communication with performance partners and NSOs about sport-life balance and retirement support. Paul expressed a great level of passion in his efforts to encourage athletes to engage in proactive retirement measures. Paul shared his insight on the steps Game Plan will be taking to address the identified gap of poor knowledge dissemination. Paul stated that "...Game Plan's advisors are working on connecting with NSO coaches, but [they believe] the coaches do not know how much of an influence they have.... [Thus,] the first step is educating coaches, which Game Plan is working on." Paul believes Game Plan's "hands are tied with funding and funding changes would have an immediate impact on the sport system – how [NSOs] prioritize mental health, athlete well-being, retirement – everything." Paul elaborated to discuss his thoughts on the impact Game Plan can have. Specifically, if funding changes were made across the sport system to better prioritize the overall well-being of athletes.

Paul appeared optimistic when reflecting on the progress he's witnessed over the past two decades. As he's navigated from his role as an athlete, to a coach, to now a performance partner he is excited to see how the Canadian sport system will continue to progress in preparing and supporting athletes' retirement.

Performance partners Pam and Paul highlighted the limited and poor knowledge dissemination pathways across the sport system. They believe Game Plan's retirement resources are not effectively being presented as available to NSOs. Both performance partners also addressed challenges related to the inconsistent and impartial distribution of funds across the sport system. Funding discrepancies and inconsistent funding distributions appear as barriers to accessible retirement support.

Discussion

The purpose of this study was to examine the perspectives of retired athletes, active athletes, support personnel, and performance partners' understanding and perception of athlete retirement mechanisms to better understand athletes' willingness and ability to engage with retirement support. Findings from this research build on the conceptualization model of adaptation to retirement among athletes (Taylor & Ogilvie, 1994) by identifying environmental contributions specific to the Canadian sport system. Further, this research builds on recent calls for action encouraging researchers to explore athletes' training environments to advance our understanding of contributing factors to athlete retirement experiences (Stambulova et al., 2020).

Taylor and Ogilvie's (1994) model showed that adapting to retirement is influenced by, among other factors, the athlete's perception of control in their preparation for retirement. Our findings show support personnel lacked adequate understanding of the available retirement resources. Furthermore, these findings showcase athletes' observations of support personnel's

direct or indirect messages that influence whether athletes perceive they can engage with retirement support without risking potential negative repercussions on their athletic career.

The Canadian sport landscape currently offers retirement resources in line with the pre-retirement planning recommended in the conceptualization model of adaptation to retirement among athletes (Taylor & Ogilvie, 1994). Specific recommendations outlined in sport retirement literature include enabling athletes to engage in retirement preparation through holistic dual development (e.g., post-secondary studies, work, and family development) and supporting athletes through both athletic and non-athletic domains (Henriksen et al., 2010; Wylleman et al., 2013). Preparing athletes for their retirement is most effectively done when the responsibility is shared amongst members of athletic organizations (Miller & Buttell, 2018; Singer, 2005). From the current study, we see organizational financial inequities, sport members' low knowledge of resources, and high-performance sport cultures as organizational barriers for athletes wishing to have a healthy sport-life balance and prepare for life after sport (Game Plan, 2023). Providing athletes with retirement support resources that can be accessed only in specific environmental circumstances demonstrates the urgent need for formalized organizational approaches to ensure athletes have full autonomy in utilizing retirement support resources.

Historically, any form of cultural change in government-funded sport organizations was met with a great level of resistance (Winand & Anagnostopoulos, 2017). Sport members often perceive a disconnect between their own professional success and organizational needs (Joachim et al., 2021). Previous research has outlined sport members' lack of awareness, guidance, resources, and time as organizational barriers to supporting athlete retirement (Miller & Buttell, 2018). The findings from this research provide explicit retirement related examples of the organizational disconnect derived from the quantity and quality of retirement information shared

with different types of sport members. Additionally, the culture enabled by performance partners and upheld by support personnel was shown to de-prioritize athlete retirement in specific personas, which effectively deprioritized trust and overall well-being of athletes within their sports organization.

Findings from this study are consistent with that of Poucher et al. (2023), Sauve et al. (2023), and Clemmet et al. (2012), wherein support personnel are identified as influential orchestrators of athletes' mental health, well-being, and the training environment. Comparably, these findings suggest support personnel are unsure who carries the responsibility to inform, guide, and facilitate environments that enable athletes to prepare for life after sport. Furthermore, support personnel have demonstrated a lack of awareness of the influence they hold in fostering and upholding a culture that dictates an athlete's ability to engage in retirement preparation.

Furthermore, performance result trajectories and the ability of athletes to engage in a sport-life balance were also discussed in the context of an athlete's retirement decision. Of note, athletes who train in sport environments that enable and encourage a sport-life balance show promise to extend their careers. Additionally, athletes who engage in a sport-life balance have been noted to experience higher levels of satisfaction (Pawoko et al., 2019). This is significant because athletes who train in environments that restrict or hinder their ability to engage in sport-life balance can be left with feelings of dissatisfaction and may be poorly prepared for life after sport (Brassard et al., 2022; Monton et al., 2022). Though the cause and effect relationship of athlete satisfaction and athlete retirement is not definitive, various factors can contribute to an athlete's retirement decision: mental health (Walton et al., 2021), well-being (Chen & Kee, 2008), burnout (Lopes & Vallerand, 2020), and performance (Burns et al., 2022); all these factors present growing potential for developing dissatisfaction.

Overall, these findings are useful to conceptualize systemic environmental retirement influences across the ecological system of sport and to identify the type of cohesive alignment required from sport members to foster sport environments that facilitate athletes' willingness and ability to engage with retirement support. As variables involved in athletes' preparation for life after sport, sport members' influence on athletes' retirement preparation and their familiarity with support mechanisms may appear as independent elements; however, both are connected and essential for NSOs that aim to facilitate this process.

Limitations and Practical Implications

This study is not without limitations. The following limitations should be considered; lack of member reflections during the composite persona creation and technology fatigue from participants. Member reflecting is a method used to demonstrate rigour when judging qualitative research (Smith & McGannon, 2018). This process begins by the researcher sharing their interpretations of the data, and in this case the personas, and providing the opportunity for a participant to provide feedback as well as challenge and interpretations (Smith & McGannon, 2018). This practical opportunity had potential to strengthen the co-participatory nature of this study. Researchers are encouraged to engage with member reflections when conducting future research.

The second limitation worthy of note is technology fatigue. Initially, the researcher planned to conduct the empathy interviews in person. However, due to stay-at-home orders issued because of COVID-19, the researcher was forced to adapt and conduct the interviews virtually. As individuals all around the world were forced to work from home to respect stay-at-home orders, researchers have noted a decrease in people's overall willingness to focus and

contribute to virtual discussions due to technology failure (Kohnke & Moorhouse, 2020). As such, the limitations mentioned should be considered when reviewing the results of the study.

This research also leads to some practical recommendations for the sport system. The burden athletes face in utilizing retirement support in what can be in unsafe, unsupportive, and irresponsible environments is too much for athletes to manage on their own (Burke, 2021). Overwhelmingly, this study's findings reflect the reality that further awareness and education for sport members is needed to foster environments where athletes feel safe voicing their desire to advance areas of their lives outside of their athletic training and performance (Brassard et al., 2022). Support personnel, who inhabit positions of power in the ecological system, should understand the resources and be equipped with the knowledge to empathetically foster and promote environments that enable retirement preparation (Knights et al., 2019; Kuttel 2017; Stambulova et al., 2007).

Support personnel must be informed on the boundaries within which they should act to guide athletes to appropriate forms of retirement support. Over the past few years, resources for athlete wellness and holistic development have changed, have been adapted, or have ceased to exist (Game Plan, 2023). Accordingly, support personnel must remain informed of ongoing changes to ensure they can foster an environment where athletes feel empowered to prepare themselves for their lives after sport. Similarly, Standard Mental Health First Aid Training was designed to help increase peoples' understanding of mental well-being, mental health symptoms, and how to respond to acute or chronic mental disorders (Kitchener & Jorm, 2002). During this training, individuals are taught how to gauge the level of crisis and how to adequately support someone in crisis to the best of their skill level; however, individuals are also taught they are not mental health professionals. Therefore, they have limitations within which they must stay to

support the well-being of all parties involved (Kitchener & Jorm, 2002). A similar concept could be applied within the context of athlete retirement, where sport personnel receive training that increases their understanding of their involvement in fostering an environment that enables, restricts, or hinders an athlete's ability to prepare for retirement. This training should educate support personnel on how to guide and support athletes in their preparation for retirement in a way that is appropriate to their specific role.

Moreover, the responsibility to prepare and support athletes does not start and end with support personnel. This research provides insight into the harmful effects that neglectful leadership within sport organizations can have in preparing support personnel to learn about and reinforce available athlete retirement resources to best guide athletes' retirement transition. The findings showcased levels ranging from extensive to limited understanding of the importance and process in which athletes engage to prepare for life after sport. Support personnel identified informal onboarding processes or simply not allocating time to familiarize themselves with resources available to support their athletes. As such, informal or rushed onboarding processes for new hires put athletes in danger of consulting with ill-informed support personnel. This barrier is magnified within the sport context as the turnover rate for support personnel is constant (Argentieri et al., 2019). A formalized support personnel onboarding process in collaboration with performance partners such as but not limited to Game Plan is suggested to ensure support personnel are adequately and consistently informed on the landscape of resources. Through these changes, the burden and responsibility to inform, guide, and support athlete retirement preparation is distributed beyond athletes and shared with members across the high-performance sport system.

Conclusions

Successful athlete transition has been defined as the maintenance of sustainable health and well-being following sport departure (Stambulova et al., 2021). Consequently, when organizations enable and support athletes towards sport-life balance and retirement support, athletes can prepare for athletic retirement. Support personnel and performance partners, who have arguably the most influential role in supporting athletes, hold a responsibility to foster an environment that enables athletes to prepare for life after sport. Athletes also have a responsibility to seek out proactive and reactive retirement forms of support and engage in prescribed proactive measures from a trained professional. The uncertainty of experiencing an anticipated or unanticipated transition from sport should further emphasize the urgency required from athletes to engage with retirement resources as early in their high-performance careers as possible. Sustainable changes to the sport landscape are required to improve athletes' autonomy, willingness, ability, and accessibility to retirement resources. This responsibility lies with sport organizations and coaches to foster environments where athletes are empowered and encouraged to use resources that prepare them for life after sport.

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Article Three

Design Thinking Practices Used to Enhance Athlete Retirement Support Through Collaborative Innovation

Abstract

The objective of this study was to collaboratively innovate sustainable prototypes to support Canadian high-performance athletes' retirement needs. Each of the 15 participants held one of the following roles in the ecological sport system: retired Olympian or Paralympian, performance support personnel, or performance partner. Participants took part in one of two, three-hour virtual co-design sessions that guided them through cognitive, strategic procedures from the Stanford d. school's five step model of Design Thinking: empathize, define, ideate, prototype, and test. Data were obtained from audio and video recordings as well as participants' notes. In the co-design sessions, participants designed solution-focused prototypes to improve the retirement support available to Canadian high-performance athletes. The following prototypes were proposed: (a) a new funding model, (b) external collaboration, and (c) further coach education about athlete retirement. The design process as well as each prototypes' generated risks, opportunities, and indicators for success are discussed. This study provides new insights to a process that empowered sport members to collaborate, and co-design practical prototypes targeted at reducing identified athlete retirement gaps.

Keywords: athlete well-being, life after sport, ideation, sport organizations

Lay Summary: An organizational approach was used to address athlete retirement within the Canadian high-performance sport system. Following two co-design sessions, retired athletes, support personnel, and performance partners engaged in Design Thinking practices to design three prototypes to address barriers athletes face in accessing forms of retirement support.

Implications for practice:

- Performance partners and sport organizations must recognize the key role they play in stigmatizing athletes preparing for life after sport
- Organizations can support athletes' retirement proactively through enforced education of resources, policy changes, and advocacy
- Those seeking to advance a cultural shift should consider the voices and insight from diverse members in the sport community as their experiences are unique and can provide rich influential insight

Introduction

Olympic and Paralympic athletes endure countless hours of training in the pursuit of competing on the international stage. The Olympic and Paralympic Games occur every four years, leaving athletes with ample time to develop and advance elements of their lives beyond sport performance. Solely focusing on performance can result in neglecting areas of one's life, presenting harmful risks to personal health and well-being (Sauvé et al., 2023), and risks that can extend into athletes' lives after sport (Alfermann et al., 2004; Barriopedro et al., 2019). In recent decades, athletes have reported to experience psychological, emotional, and physiological challenges related to their retirement from sport (Clemmet et al., 2012).

Taylor and Ogilvie's conceptual model of adaptation to retirement among athletes identifies specific factors that can influence athletes' transition experience such as: individual characteristics, social standing, and access to retirement resources (1994). This conceptual model provides valuable insights that shape our understanding of how some athletes may adapt to life after sport with minimal challenges while others may experience a retirement related crisis (Taylor & Ogilvie, 1994). Researchers have identified the elements related to positive retirement experiences (Lally, 2007; Torregrose et al., 2015), the coping strategies used to address

identified athlete retirement needs (Clowes et al., 2015), and the need for accessible and proactive retirement resources (Coakley, 2015). This research has led to the creation of organizations like Game Plan: an organization that provides Canadian high-performance athletes (HPAs) with free resources to help their holistic wellness needs; supporting HPAs with the tools, skills, and practices to proactively and reactively support their transition out of sport (Game Plan, 2020). However, the pervasive performance driven culture of high-performance sport presents certain barriers that discourage athletes from engaging in holistic development practices that can support their inevitable transition out of sport (Brassard et al., 2022; Poucher et al., 2023).

Studies have highlighted that sport organization administrators, coaches, and staff influence athletes' cultural environments in sport by intensely prioritizing perfection and nurturing a results-above-all environment (Poucher et al., 2023). On a fundamental level, effort from all parties in a sport organization is required to collectively address and improve the cultural elements that prevent athletes from utilizing retirement resources to advance and support their holistic wellness and life after sport (Surujlal, 2016). Traditionally, research on athlete retirement has been conducted through the lens of athletes (e.g., Brown et al., 2018; Fernandez et al., 2006; Jewett et al., 2019). Sampling participants from multiple levels of the ecological system of sport facilitates a deeper exploration of athlete development, including individuals' retirement preparation experiences within changing environments (Bronfenbrenner, 1977;1979). As a result, the authors deemed the following collaborative approaches; Design Thinking (Hasso Plattner d.School, 2022) and Bronfenbrenner's Ecological System Theory (EST; 1979) as appropriate methodologies to address this area of focus and catalyze this needed cultural shift.

Design Thinking

Innovation is at the core of Design Thinking: it is used to promote new designs, creations, and ways of living for pleasure, impact, and change (Panke, 2019). The methodology of Design Thinking fosters innovation through creative approaches, grounded in human-centred problem solving (Rowe, 1991). This iterative process consists of methods used for defining and then solving problems through collaborative innovation with practitioners and end-users (i.e., members in the sport system). The Design Thinking process involves defining the problem, understanding the end-users, and then utilizing Design Thinking tools to collaboratively develop a solution to the indicated problem.

The Stanford Hasso Plattner Institute of Design, also known as the “d.school”, is viewed as one of the trailblazing educational sites for Design Thinking. It is known for the emphasis on collaborative innovation (Liedkta, 2015). The program has prompted researchers to utilize their methodology by publicly sharing the Stanford d.school Design Thinking process consisting of five iterative phases, each foundational to the next: (1) empathy, (2) define, (3), ideate, (4) prototype, and (5) test (Hasso Plattner Institute of Design, 2023). Multiple sources of data are collected throughout every phase; each yielding various forms of inquiry that propel the next phase (Tschimmel, 2011).

The objective of the first phase is to gain empathy of end-users. Researchers often utilize mixed research methods to explore a population to determine the potential for impact (Banerjee & Gibbs, 2016). If impact is plausible, researchers work to establish relationships with the end-users, form connections, and begin to understand the problem from end-users' diverse perspectives. The second phase is to define. Here, the goal is to gather data to identify and define the gaps, problems, and area(s) of hopeful contribution to support the diverse needs of end-users.

Research methods may include traditional or empathy interviews, observations, storytelling, or mind mapping (Chasanidoi et al., 2015).

With the problem (re)defined, the next phase is ideation where idea generation occurs through guided, collaborative brainstorming exercises. Researchers are encouraged to establish a judgement-free environment by encouraging participants to prioritize the quantity over quality of innovative ideas they think of. Researchers can utilize brainstorming funnel exercises to encourage participants to collaboratively identify the most suitable suggestions to build on based on the following criteria: feasibility, viability, and practicality (Hasso Plattner Institute of Design, 2023). Following a consensus, researchers and end-users continue to collaborate to bring ideas to life in the form of prototypes.

Once prototypes are designed and created, the final phase is to test the designs on a large or small scale. The prototypes must be tested thoroughly with end-users in the identified context. Researchers should seek to understand how end-users respond to the prototypes, as well as explore what changes need to occur to enhance the effectiveness of the design (Gottlieb et al., 2017). Science traditionally investigates extant forms of inquiry established by principles and sound forms of logic while Design Thinking initiates novel forms through abductive thinking and ambiguous or limited forms of evidence (March, 1976). Thus, within Design Thinking, traditional project outlines and construction cannot be determined logically as the mode of reasoning is abductive (Liedtka, 2018). Design Thinking facilitators construct designs with, rather than for end-users, therefore, allowing end-users to be co-designers.

Athlete Retirement

There is minimal exposure to Design Thinking in sport performance psychology research. Within this field, researchers and consultants work together to identify and address areas of growth that can support and optimize the emotional, psychological, and performance of HPAs (Hays, 2012). One research sector where more research is needed is athlete retirement (Stambulova et al., 2020).

Over the last decade, Canada has invested in Game Plan; a third-party organization to support and enhance the retirement preparation of HPAs. However, Canadian HPAs are underutilizing these resources. This underutilization may correlate with hostile sport organizations reported to present barriers for athletes who wish to engage in proactive retirement planning (Brassard et al., 2022).

Design Thinking methodologies provide opportunities for human development, knowledge creation, and innovation to occur across domains when individuals collaborate from various roles and communities of knowledge, such as in sport (Carlile, 2004; Boland & Tenkasi, 1995). The multi-person human development system of high-performance sport is composed of active athletes, retired athletes, support personnel, and performance partners; each of whom contribute to the performance driven culture that can present barriers for athletes wishing to develop and maintain a sport life balance to support their preparation for retirement. Furthermore, each of the aforementioned roles are considered as an ‘end-user’ as they all will be a user of the finalized design in some capacity.

Barriers to athletes accessing retirement support can be a result of relationships and interactions (micro systems), athletic environments (meso system), and/or social and cultural values (exosystem; Bronfenbrenner, 1997;1997). Fostering sustainable cultural change within the multilayered ecological sport system requires a collaborative effort from all members

(Bronfenbrenner, 1997). As a result, a Design Thinking approach supported by the framework of Bronfenbrenner's (1979) ecological systems theory was deemed suitable to advance athlete retirement efforts through collaborative innovation.

Within the Canadian high-performance sport system, active and retired athletes sit at the core as all resources are designed to support their performance needs. Once an athlete earns a roster position on a national team and funding from the Athlete Assistance Program (AAP; Sport Canada, 2023) they are granted access to Game Plan's resources for free. Athletes who receive funding for a minimum of three years are also eligible for financial retirement adjustment support for up to two years following their retirement from the national team (Game Plan, 2020).

Within the sport system, athletes tend to have the least amount of authority and influence in shaping the culture of their environment (Fletcher & Arnold, 2011; Sauve et al., 2023). Specifically, in result-driven, high-performance sport environments, athletes have reported to experience immense pressure to conform to the unrealistic and often unattainable cultural performance driven norms of their sport organization, such as performance perfection and a 'success by any means' approach (Coakley, 2015). Such cultures can neglect and undermine essential elements of life outside of sport and present a risk for athletes' quality of life during and after sport (Esopenko et al., 2020; Hardy et al., 2017). As core members in the system, athletes are deemed as central end-users of a designed product who directly experience the effects of cultural changes or lack thereof. As end-users, their input and collaboration are vital to ensure designed changes meet their retirement preparation and support needs.

The micro (second) and meso (third) layers in the sport system consist of support personnel and performance partners. Both roles hold authoritative positions over athletes and are key decision makers in areas of roster selection, playing time, organizational rules, regulations,

and funding distributions (Fletcher & Arnold, 2011; Sauve et al., 2023). Support personnel are individuals with varied expertise who are orchestrated to optimize athlete performance (Canadian Sport Institute, 2023). Support personnel can consist of performance coaches, athletic therapists, physiotherapists, sport medicine doctors, strength and conditioning coaches, sport nutritionists, mental health practitioners, and mental performance consultants (Canadian Sport Institute, 2023). Performance partners such as Own the Podium, the Canadian Olympic Committee, The Canadian Paralympic Committee, and Game Plan work alongside sport organizations to support the training and development of athletes.

Own the Podium is a performance partnering organization, in what is considered as the mesosystem layer of the sport system, due to their distant, yet influential impact on athletes. Own the Podium supports NSOs through technical leadership and conducts annual performance potential assessments used to make funding recommendations to national funding parties (Own the Podium, 2023). NSOs with promising results or projected podium success are well positioned to receive a funding recommendation by Own the Podium that can lead to generous financial investments to fund athletes, staff, development, training facilities, and competitions. Currently, the assessment used by Own the Podium is solely performance driven. As such, NSOs with successful performances are positioned to be financially rewarded. With such significant power and recommendations for monetized incentives, one can argue Own the Podium contributes to upholding the results-driven culture of high-performance sport. This pervasive results-driven culture (exosystem) has been noted as discrediting a sport-life balance and has been reported as harmful to athletes' well-being (Sauve et al., 2022) and poorly positioning athletes for their life after sport (Lally, 2007). Of note, recent criticism of the medals-first approach led to the following message from Own the Podium's CEO in 2022 "It's not just about reaching

performance goals, but how you achieve those goals in a supportive culture of excellence that is safe for all to enjoy the journey. We've been working very hard on that." (CBC, 2022). In the referenced article, the CEO acknowledges that the initial primary focus was medals, however, efforts are being made to have more of a "values-based approach" in their work with NSOs.

Additional significant performance partners include the Canadian Olympic Committee (COC), Canadian Paralympic Committee (CPC), and Game Plan. Both the COC and CPC, deliver support and resources to advance Olympic and Paralympic athletes in pursuit of international podium success (Olympic, 2023). Finally, Game Plan is a program that seeks to support the life-sport balance for national athletes through retirement, career, community, and educational guidance, including skill development and health resources (Game Plan, 2020).

The embedded power hierarchy in the high-performance sport system showcases the shared responsibility for shaping a culture that understands and prioritizes athlete retirement. As such, if a cultural shift is to occur within the sport system, participation from athletes, support personnel, and performance partners is vital. The collaboration of all parties will allow for unique insight, realistic guidance, and fruitful collaboration in pursuit of advancing retirement support for athletes.

This study is the final phase of a multi-phase project that adopted a Design Thinking approach to further the retirement support and preparation of Canadian HPAs. In the previous phase, researchers embarked on the first of five phases in the d.school Design Thinking phases: empathy (Hassan, 2023). Within that phase, 19 end-users across the Canadian sport system were interviewed to explore their relationships, perception of accessibility, and understanding of the retirement mechanisms across the sports landscape. Following the collection of data, personas (i.e., fictional characters) were created and used to succinctly summarize the experiences of the

different end-users. These personas showcased various relationships, accessibility, and understandings participants held regarding athlete retirement support mechanisms (Hassan, 2023). This research extends the previous study by engaging in the final four phases of the design school Design Thinking process: define, ideate, prototype, and test to collaboratively innovate a sustainable prototype to advance athlete retirement support in Canadian high-performance sport.

Methodology and Methods

To address the research goals, the current study was framed within a collaborative inquiry approach, grounded within a participatory paradigm. Within this approach, the social construct of knowledge is facilitated through shared dialogue, reasoning, and interactions between the inquirer and the inquired (Lincoln et al., 2017). Considering the collaborative, innovation-driven efforts employed by the Design Thinking approach, a collaborative inquiry methodology was considered the appropriate methodological choice for this study. According to Cochran-Smith and Lytle (2009), collaborative inquiry is explained as communities of research where multiple collaborations occur to engage in iterative cycles of investigation, research, data collection, analysis, and problem solving. This form of inquiry is anchored in the co-construction of knowledge, shared agency, and typically, solution-driven research.

This approach provided members in the sport community a voice to share their experiences with retirement support, their desires for change, and provide them with an opportunity to engage in action to address identified gaps. Through this collaborative design, researchers and participants are viewed as co-researchers, both having shared significant roles in the research design and implementation process (Bray et al., 2000). Furthermore, this research is grounded in the inquiry of the participants' human experience, thus researchers and participants engage in reflection and action to collaboratively address research questions of relevance to the group (Bray et al., 2000).

Co-Researchers

Two three-hour virtual co-design ideation sessions took place during the summer of 2022. End-users joined from various provinces across the country such as Alberta, British Columbia, Ontario, Nova Scotia, Quebec, and Saskatchewan. The first session comprised eight end-users, of whom two were athletes who retired following the Tokyo Olympic or Paralympic Games, two were members of a national team support personnel, and four were from the following performance-partnered organizations: Game Plan, Own the Podium, The Canadian Olympic Committee, and the Canadian Paralympic Committee. The second session consisted of seven end-users, of whom one was an athlete who retired following the Tokyo Olympic games, three were support personnel, and three were from the following organizations: Game Plan, Own the Podium, and the Canadian Olympic Committee. The co-design sessions were held virtually, over the platform Zoom. End-users were required to engage in activities on the platform using Mural. Mural allows for several users to view, add, and rearrange sticky notes on a virtual board. The participants were led through brainstorming cluster exercises (Osborn, 1957) to further define and ideate. Following these exercises, participants were then guided through collaborative prototyping and testing using how-might-we prompts that explored each prototypes risks, indicators, and opportunities for success.

Procedure

Ethical approval to conduct this study was obtained from the researchers' university office of research ethics and integrity. The co-design sessions consisted of a one-time, three-hour online session where participants were introduced to one another, and led through various collaborative, innovative, solution-driven exercises. Participants were informed that they could withdraw from the group at any time without repercussions. Participants were also provided with

the contact information of the Canadian Centre for Mental Health in sport, should they wish to seek psychological support following the co-design session.

Data Collection and Analysis

Data were collected and analysed by end-users during the co-design sessions. Data were collected through sticky notes, audio, and video recordings. The iterative process of Design Thinking is reflective through the iteration of collecting and analyzing data. End-users repeatedly engaged in a 4-step brainstorming cluster exercise adopted by Osborn (1957) that included steps to support a latent semantic analysis (Landauer et al., 1998). Once the prototypes were designed, a modified strength, weaknesses, opportunities, and threats (SWOT) analysis was conducted collaboratively to assess each prototypes' impact and effectiveness (Helms & Nixon, 2012).

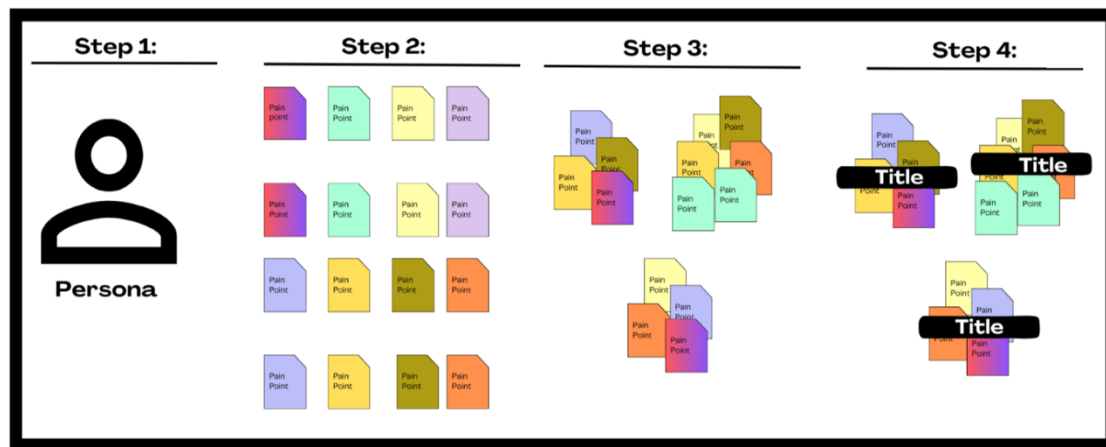
This cluster exercise positioned end-users to generate and analyze data collaboratively and thoroughly, to propel each process through the following d.school Design Thinking steps: define, ideate, prototype, and test. This form of analysis generally follows two overarching steps: 1) creating a categorical matrix to organize the data and 2) conducting a singular value decomposition to reduce the dimension of the data set by using latent techniques, such as clustering (Landauer et al., 1998). Both of these steps are integrated in the brainstorm cluster exercise.

The participants were first shown evidence-based previously published personas reflective of sport members to gain familiarity of the landscape (Hassan, 2023). Personas provided insight into the understanding, accessibility, and relationship end-users have with athlete retirement support mechanisms. Once shown the personas, the participants were guided through a four-step brainstorming cluster exercise (Osborn, 1957): 1) review the persona to learn

about the specific end-user, 2) use sticky notes to identify each perceived pain point relating to athlete retirement mechanisms, 3) work as a team to cluster relevant sticky notes, and 4) collaboratively create a succinct title for each cluster.

Figure 1.

Demonstration of Brainstorming Cluster Exercise



Note: This figure illustrates a small-scale replica of the Mural platform used to conduct the brainstorm cluster exercise for each persona. This replica exhibits 8 end-users, each with their own sticky note color.

Steps 1 and 2 required end-users to independently brainstorm by using their assigned sticky note colour to identify and post the insights or pain points they perceived from the specific persona. During the co-design sessions in this phase, each end-user posted an average of 4 sticky notes per persona. The participants reviewed and discussed their peers' sticky notes. Next, they were instructed to engage in Step 3, which commenced the analysis process. Step 3 required the end-users to collaborate and create clusters of sticky notes that shared a form of relevance. This resulted in various discussions and the participants moving sticky notes across the virtual

platform to create several colorful clusters of relevant sticky notes. Prior to moving onto Step 4, the participants were encouraged to review their clusters collectively to assess whether they could merge any clusters to create a larger cluster, should these clusters share relevance. During this time, various in-depth conversations occurred with the participants describing their sticky notes, sharing stories, expressing knowledge regarding the retirement landscape, and disclosing personal connections.

Once participants finished clustering their sticky notes, they worked together to establish a succinct, descriptive title for each cluster. The following are examples of some of the cluster theme titles from various personas: National sport organization culture, barriers to accessing support, mental health and wellness, accessibility, Para sport IQ, and the absence of athlete wellness onboarding prioritization.

Once the overarching titles were established for each persona, the end-users re-engaged with Step 3 and 4 (See Figure 1) of the cluster exercise to generate overarching cluster themes reflective of all personas. Co-design group 1 was left with two overarching themes and Co-design group 2 with three overarching themes. The following are some examples of the overarching themes generated through the cross-persona examination: formalized prioritization of total athlete wellness reflective of (new) performance theory, barriers to resource uptake, and NSO culture.

The title identification marked the conclusion of the define and ideation phase. At this point of the co-design session, end-users (after a 10-minute break) transitioned to the prototype and tests phases of the d.school Design Thinking process. “How might we” (HMW) brainstorming prompts were used to guide the prototype innovation for this project. HMW questions are best known for fostering inspiration, focus, and collaborative idea generation

(Gottlieb et al., 2017). The end-users were instructed to collaboratively transform their final cluster titles into HMW statements. For example, one final cluster titled, “formalized prioritization of total athlete wellness that is reflective of (new) performance theory” was transformed into a HMW question that read “how might we change our funding metric to incentivize supporting athlete wellness?”. Posing the overarching pain points as a question positions the participants to generate discussion that seeks solutions.

The participants were given time to formulate and post their versions of the HMW statements. A total of 13 HMW statements were posted in the first co-design session, and a total of 10 were posted in the second session. The technique of dot voting (Dalton, 2018) was employed for the participants to vote and indicate which two HMW statements (per co-design session) they felt best represented the end-users' needs. This predetermined number on two was established by the researcher to ensure participants had enough content to progress to the next phase within the remaining time left in the co-design session. Design Thinking facilitators are encouraged to progress through the phases within a timely manner to ensure participants remain engaged, optimally (Tschimmel, 2011). As a result, structural decisions were made by the researcher to ensure there was a timely progression through the phases. Voting was done by each participant placing a dot near their two preferred HMW statements. Following the indication of the strongest two HMW statements, the participants then re-engaged in brainstorming to generate responses to the HMW statements (i.e., possible solutions). The participants received time to independently generate and post ideas and then collaboratively engaged in Step 3 and 4 of the cluster exercise (See Figure 1) to cluster and title relevant solutions. The dot voting technique was applied again to identify the two most desirable, feasible, and viable prototypes.

Following the identification of the two prototype finalists in each co-design session, the participants were led through an exercise to test each prototype. The participants were instructed to conduct an assessment by first reflecting on the feasibility, practicality, and viability of each prototype and then by using sticky notes to brainstorm and identify the risks, indicators, and opportunities for success for each prototype. The diversity in each co-design group allowed for distributed input from all levels of the Canadian sport system. In summary, the participants, who are also end-users worked together to define, ideate, prototype, and test the final prototypes they believed would have an impact on better preparing Canadian athletes for their retirement out of high-performance sport.

Results

The findings consist of three prototypes developed during the co-design sessions: (a) new funding model (b) strengthened external collaboration, and (c) further coach education about athlete retirement. Each co-design group designed two prototypes, one of which was collapsed (prototype a), due to overlap. The three prototypes were inductively developed to address the athlete retirement needs perceived by diverse members in the sport community. The identified opportunities, indicators for success, and risks will be shared. To ensure anonymity, the participants were assigned pseudonyms. See the figure below.

Figure 2.

Chart Organizing Co-design Participants

Participant's Name	Role in the Sport System
Ren	Retired Athlete
Regan	Retired Athlete
Ronald	Retired Athlete
Sonni	Support Personnel
Sara	Support Personnel
Sam	Support Personnel
Sarani	Support Personnel
Syla	Support Personnel
Peter	Performance Partner
Paula	Performance Partner
Penny	Performance Partner
Pearson	Performance Partner
Parker	Performance Partner

New Funding Model

During the co-design sessions, members indicated that a new funding model that prioritizes athlete wellness has significant potential to better prepare and support athletes for retirement. This innovative prototype was a result of co-designers identifying a trend in athlete wellness neglect from various roles in the sport system including support personnel and performance partners.

Performance partners and staff disclosed the parallels between funding incentives and the order of priorities evident in national sport organizations. Efforts have been made to introduce and support athlete wellness; however, co-designers expressed great concern with the need to

introduce and prioritize athlete wellness practices within an “outdated funding model that serves it no value”- Peter. Presently, there is a perception that when funding structures solely seek to reward performance, they inherently influence a relentlessly toxic environment that “heavily prioritizes results and leaves no one accountable to support the holistic well-being elements of the athletes” Sunny shared. In pursuit of prioritizing results, “[support personnel and athletes] experience performance driven pressures that span across the sport culture. The indirect message we receive is ‘you and your coaches don’t matter unless you medal’” Ren shared.

Paula informed the group that presently, there are no formalized methods to consider or evaluate how organizations are supporting the holistic development of active or retired athlete well-being. As a result, sport organizations outline their annual priorities to align with the funding model to ensure they best position themselves to obtain as much funding as possible. Sara has worked with various sport organizations and has observed that organizations with limited funding are forced to prioritize what they can, and “sometimes - most times - anything outside of performance is ignored.”

To operationalize a person-first approach that holistically supports athletes before and after they retire, a new funding model was proposed. Co-designers identified the need to expand the current funding model to include measurements beyond performance potential such as athlete and support personnel well-being, satisfaction, sport-life balance, and athletes’ preparation for retirement.

Regarding the practicality of this new funding model, the co-designers identified the risks, indicators for success, and opportunities should changes be made. Sam expressed concerns regarding the accountability element of a new funding model: “well, some will treat it like a ticking box, finding ways to circumvent true change.” Others such as Regan and Peter believed a

new funding model would hold sport members accountable to prioritizing health and well-being. The co-designers believed funding model changes promoting well-being in pursuit of performance excellence could present opportunities for athletes and coaches to remain in sport longer due to the increased enjoyment and decreased pressure-related stressors. As the co-designers continued to identify risks, indicators for success, and opportunities, they concluded that a new funding model would support proactive and reactive athlete retirement efforts through incentivizing the holistic care of athlete well-being. A full list of each prototypes' risks, indicators for success and opportunities are listed in Figure 3.

Figure 3.

Prototypes' Risks, Indicators of Success, and Opportunities

New Funding Metrics Prototype	Risk	- fear of it being treated like a ticking box - lack of infrastructure to enforce accountability - sport organizations will find ways around it - no real shift in perspective - concerns about OTP's level of buy-in - wellness continues to be only viewed as a means to performance
	Indicators of Success	- traditionally lower funded programs will get the support they need - increase in athletes' overall wellness, satisfaction, and well-being - athletes believe their wellness does not have to be comprised to achieve desired performance
	Opportunities	- enforce accountability - promotes healthier athletes that can also perform - recalibrate what we identify and fund as 'important' - enforces the prioritization of athletes' well-being
External Collaboration Prototype	Risk	- viewed as another mundane formality document to sign - addition of responsibilities to overworked and burnt out workers - push back from coaches - neglect to consider logical concerns
	Indicators of Success	- shared ownership with coaches and organizations to collectively prioritize athlete development and well-being - annual or consistent education from GP that is initiated by NSOs - commitment for partnership and follow through on information sharing from NSOs to athletes - diverse voices are being used to uphold partnership
	Opportunities	- traditionally lower funded sports get the opportunity to be informed on new and relevant resources - athlete voices are heard and prioritized - knowledge and importance of athlete retirement is shared collectively
Coach Education Prototype	Risk	- overlap with excessive amount of coach resources that exist - too many coach-support delivery agents (Coaching Association of Canada, Canadian Olympic and Paralympic Sport Institute, Provincial/Territorial Coaching Representatives, & Own the podium) - additional perceived burden on coaches - opportunities costs of more coach training
	Indicators of Success	- less safe sport issues due to advancing coaches' knowledge - longer careers for athletes - enhanced athlete satisfaction - enhanced coach well-being - measureable change in athletes' perception of autonomy support
	Opportunities	- coaches learn how to build trust with athletes - coaches learn how to make sport environments better for athletes - retention of coaches within the sport system

Notes: This figure displays the co-designer's interpretations of the risks, indicators of success, and opportunities for each of the prototypes co-created in the co-design session.

Strengthening External Collaboration with Game Plan

As active co-design participants, stakeholders provided insight into organizations that are deliberate and committed about connecting athletes with their services. For example, some organizations may have a Game Plan advisor speak to their athletes during different phases of their season, while other organizations fail to respond to their Game Plan advisor's request to arrange a time to speak with their athletes. Thus, many athletes may have neither an interaction nor formal introduction to Game Plan advisors or the resources they offer.

Sam disclosed having a “very low level of knowledge with what Game Plan has to offer”. This co-designer continued: “It sounds like I would be well positioned to make the connection [with my athletes] happen. To be honest, I don't even know how or when to do that”. A large majority of the co-design participants disclosed having a very low level of knowledge and understanding of Game Plan's resources. This consistent experience might explain the low referral and utilization rates: “That's an issue we've identified. Coaches don't know what Game Plan is, why [the resources] are important, or how [they] can help support their athletes” Penny shared.

On one hand, athlete-facing participants felt as though they knew the importance of a sport-life balance and how that can contribute to one's retirement experience; however, on the other hand, they felt ill-equipped in promoting or encouraging the skills that aid such balance. Following the cluster solution focused brainstorming exercise, strengthening relationships with Game Plan was proposed. External organizations such as Game Plan have employees and advisors who are deemed as experts in the skills other athlete-facing individuals felt they lacked. As such, “repositioning the support that is in place by enforcing an agreement on external collaboration with organizations can support change” shared Pearson, Sara, and Sarani via sticky

notes. Potential risks indicated by the co-designers included the worry of this agreement becoming “another formality document to sign” instead of resulting in true change, shared Regan. Sam disclosed additional concerns regarding the limited bandwidth of support personnel, presenting worries regarding who the responsibility will fall on to coordinate meetings to upkeep the agreement. Furthermore, Regan identified additional risks concerning potential pushback from “coaches who don’t want to see a change in the performance theory”.

By contrast, strengthened collaboration with sport organizations and supporting organizations like Game Plan can provide all athletes, regardless of the size or funding obtained from their sport organization, with an opportunity to learn about proactive and reactive sport life balance practices from knowledgeable advisors. A formalized collaboration agreement amongst sport organizations and athlete third-party support organizations could lead to “shared ownership over driving healthy athlete development, well-being, and system alignment” Sylva shared. Such an agreement would place the responsibility for both organizations to try rather than “only have one organization going at it alone” (Pearson). Ronald felt as though this agreement would hold sport organizations accountable for informing athletes about the available resources and supporting their autonomy to engage in personal development in conjunction with their sport activities. Please review Figure 3 for an expanded list of risks, indicators of success, and opportunities.

Furthering Coach Education About Athlete Retirement

Upon being informed of recent studies regarding Canadian retirement experiences, some co-designers appeared to have minimal knowledge on the frequency with which athletes’ experience challenges relating to their transition out of sport. Sylva disclosed wishing “coaches were educated or given tools” to proactively identify and support athletes. The co-designers

unanimously agreed that coaches heavily influence the culture and priorities practiced within a sport organization, however, concerns were raised regarding the limitations of coaches' training and knowledge and respecting coaches' bandwidth regarding their responsibilities and areas of expertise. The co-designers disclosed the effects a "results-driven" sport system has on coaches, specifically as it influences a coach's priorities. Sara has been coaching for several years, and although they knew players experience difficulties adjusting to retirement, Sara was not aware of the role and influence they had in supporting athletes' preparation.

Ren and Regan voiced their thoughts on coaches acting as a barrier to resource uptake. Ren recalled a moment in her career when her teammate was shamed for requesting alternative weightlifting sessions due to post-secondary class time conflicts. "Behaviours and responses by coaches absolutely send messages to us [players]. You can tell when your coach is annoyed, frustrated, or when they think something is a waste of time, or quite frankly, stupid. I've heard my coach challenge my teammates – once [coach] asked my teammate if she wanted to be a student or an Olympian?". Regan highlighted that the coach is not the sole influencer, rather, he believes all staff can play a role. Ronald had a different experience with the coaches and support personnel in his organization wherein they encouraged him and his teammates to explore passions outside of their sport.

"They really cared about us. My coach would talk to us about school, some of the boys had jobs, [and/or] families and [coach] genuinely cared. A bunch of us old guys still keep in touch with coach. We've attended some practices and show support when we can. A bunch of us considered retiring after Rio, and then when COVID hit, I felt lost. If it wasn't for my family and our coaches, I don't think I would've stuck around for Tokyo".

Parker and Sarai agreed on their perception of coaches taking more effective action if they learned how to do this. Co-designers agreed furthering coaches' education on athlete retirement could positively influence athletes in accessing proactive and reactive retirement support. The co-designers collectively agreed on the importance of educating coaches by providing them with tools and best practices they can use to foster environments that support athletes holistically and guide athletes to access retirement resources during and after their careers.

The co-designers continued to collaborate, identifying risks, opportunities, and indicators for success that might be present should a standardized form of retirement education be distributed to coaches. They identified the following risks: overlap with the excessive amount of coach resources that already exist, no accountability for knowledge implementation for coaches who disagree with proactive retirement preparation, additional perceived burden on coaches, and an increase in coach education fees. Some opportunities for success were projected to include less safe sport issues, measurable change in athletes' perception of autonomy support, enhanced athlete satisfaction, longer average athlete careers, and enhanced coach and athlete well-being. There were also discussions regarding the similarities in athlete and coach retirement. Sonni disclosed the possibility of coaches learning information that could prepare and support their own retirement from coaching. Some opportunities that may result from coaches receiving education on athlete retirement were improved athlete – coach relationships, the retention of coaches within the sport system, and decreased coaches' burnout due to being more knowledgeable on how to better support their athletes and themselves and increased positive experiences for athletes. For the full list of risks, indicators for success and opportunities, please refer to Figure 3.

Discussion

The purpose of this study was to employ Design Thinking practices to co-design solution-driven athlete retirement prototypes addressing the needs of end-users in the sport system. This study was the first to utilize Design Thinking practices to advance athlete retirement research. As such, it provided an opportunity for retired athletes, support personnel, and performance partners to identify gaps affecting athlete retirement and collaboratively design prototypes to address the gaps. Overall, the findings make methodological and empirical contributions to the athlete retirement literature and further elucidate the notion that Design Thinking practices can be used to advance sport performance research. The findings provided insight into gaps across the ecological system of sport that continue to uphold cultural elements presenting barriers for athletes learning about and utilizing retirement resources, which include the current funding model, limited collaboration with third-party sport organizations, and a general lack of retirement knowledge from athlete-facing individuals such as coaches and leading organizations.

For non-profit sport organizations, funding is essential for operational purposes. Various performance partners are responsible for allocating funding according to guidelines and recommendations, placing on them an enormous responsibility to ensure funding is aligned with athletes' best interests (Haut et al., 2016). Presently, the funding model incentivizes sport organizations to prioritize performance, rather than prioritizing supporting athletes' holistic needs that include proactive and reactive retirement support. For example, Own the Podium, an influential stakeholder for Canadian sport organizations provides government funding recommendations based on performance results and potential (Own the Podium, 2023). This research highlighted the long-term limitations support personnel and performance partners have

in shifting the culture to better support the well-being of athletes without new or adjusted funding models that consider and prioritize the holistic wellness and development of athletes.

Funding agencies appear to heavily influence the order of priorities within a sport organization. Studies have reported that sport organizations' funding applications can be a higher organizational priority than certain competitions (Suave et al., 2023). This paradoxical reality provides further insight to how and why performance environments foster singular focus cultures that present limited to non-existent room for holistic care elements, such as retirement support (Carless & Douglas, 2013; Kerr et al., 2020). Cultural changes that better meet the holistic needs of athletes show promising well-being benefits (Suave et al., 2023). However, such benefits may be difficult to sustain without changes to the funding model.

When sport environments operate in a culture that is driven by performance results, the mental health and well-being of athletes is directly threatened (Poucher et al., 2023). Should athletes be within a sport environment that upholds the sole prioritization of performance and hinders holistic development elements such as retirement preparation, their well-being is at risk both during and after their athletic career. This finding is important as it places the responsibility on performance partners to make the necessary changes to enhance the system of athlete care by better positioning support personnel in sport organizations. Performance partners enforce practices that establish and uphold the cultural norms adhered to by support personnel and athletes (Coker-Cranney et al., 2018). Without performance partners establishing infrastructure that fosters and encourages sport organizations to care for their athletes' retirement, support personnel are left, often unwittingly, positioning their athletes at risk for a plethora of difficulties during their retirement (Taylor & Ogilvie, 1994).

Furthermore, these findings suggest the need for educational resources to equip support personnel to better understand, prioritize, and support their athletes to engage in proactive retirement preparation. Similar to the findings from previous studies (Kerr et al., 2020; Sauvé et al. 2023), any cultural change within sport organizations requires effort and behavioural changes from all individuals, including athletes, support personnel, and performance partners. Support personnel in the present study suggested they were unaware of ideal times and best practices they can use to direct their athletes to proactive retirement support. Additionally, concerns were expressed regarding establishing and strengthening relationships with performance partner organizations such as Game Plan. In athlete-facing roles, support personnel are in highly influential positions to lead and motivate their athletes to engage in specific practices and behaviours (Gillet et al., 2010). However, without formalized training to inform those in these athlete-facing roles on why and how their athletes can engage in retirement preparation, athletes fall risk to being in environments where retirement preparation is discouraged or punished (Brassard et al., 2022). This finding exhibits the necessity of regularly educating support personnel on how and why it is important to foster environments where athletes have the autonomy to access resources to develop themselves beyond their sport performance. The findings showed that athletes who found themselves in environments where support personnel encouraged and supported holistic development such as pursuing an education or career, athletes felt a sustained motivation to continue competing. Such environments, in turn, show potential to further advance athletes' performance success, promoting as they do, athletes who are holistically fulfilled and have the sustained motivation to compete for two or three Olympic and Paralympic cycles. Though under examined, athletes have reported feeling more confident and prepared during their second or third major games (Gould & Maynard, 2009). Together, these

findings demonstrate the significance of prioritizing the holistic development of athletes, helping them prepare for their retirement and achieve long-term performance results.

Limitations and Future Directions

This study is not without limitations. As such, the following limitations must be of note; population sample size, participants' technology fatigue, and small scale testing of prototypes. To begin, one should note the Canadian sport system consists of roughly 95 sports (Canadian Olympic Committee, 2021). A total of 15 participants joined the co-design sessions from 9 organizations. As a result, the findings from this research is reflective of only a portion of the sport system. Absent notable members in the co-design sessions include high-performance directors and active athletes. The researcher encountered extreme difficulty recruiting both roles. After several failed attempts, the researcher was left to conduct the co-design sessions without active athletes or high-performance directors; both of whom are product end-users. Their lack of insight and input into the define, ideate, prototype and test phases of this Design Thinking process is considered a significant limitation.

The final limitation worthy of note is within the technology fatigue experienced by all parties in this research study. The researcher initially intended to facilitate the co-design sessions in-person. However, due to stay-at-home orders issued by the Canadian Government in response to COVID-19, the researcher was required to host the sessions virtually. The online shift has been shown to present challenges in people's ability to remain focused, engaged, and their willingness to contribute to discussions (Kohnke & Moorhouse, 2020); most of which were visible challenges in the co-design sessions. The researchers observed participants encountering technology difficulties, remaining online with clear visual and audio connection, challenges signing onto and utilizing the online platform of Mural as well as remaining focused and

engaged. As such, future researchers who plan to utilize Design Thinking methodologies are encouraged to facilitate co-design sessions in person, if and when feasible to do so.

Future empirical researchers seeking progress in this study are encouraged to employ Design Thinking methodologies to design implementation strategies for each outlined prototype. Progressing through each of the phases; empathy, define, ideate, prototype, and test to co-design implementation strategies with a variety of end-users can refine prototypes and outline scalable and feasibility implementation practices.

Conclusions

Ecological Systems Theory with a Design Thinking methodology have demonstrated through this research to be a fruitful practice to collaboratively innovate prototypes within the field of sport and performance psychology research. The Design Thinking methodology was used to generate, analyze, and test data. This study was, to our knowledge, the first to employ Design Thinking methods through an ecological systems lens to explore, collaborate, and innovate prototypes to advance athlete retirement support mechanisms. This study offers valuable knowledge and practical implications for sport performance partners, support personnel, and athletes to increase their understanding of the cultural and organizational barriers all parties face in guiding athletes to proactive and reactive retirement support. The solution-driven prototypes created by end-users outline several recommended changes needed for end-users to better prepare and support athletes for retirement. More specifically, retired athletes, athlete-facing support personnel, and performance partners have identified that a new funding model, stronger collaborations with Game Plan, and increased athlete retirement education for coaches are necessary to reduce the retirement barriers athletes are facing in the Canadian sport system.

From an organizational standpoint, sport members are seeking changes to the current infrastructures that tend to enforce the idea that performance results are the only focus and priority in high-performance environments. Providing athletes with funded resources to develop beyond their sport is exceptional; however, athletes are encountering internal organizational barriers that make it difficult to access such resources.

Given the significant influence funding has on non-profit sport organizations, sport members have provided prototypes to illustrate the responsibility performance partners have in aligning funding models to elements that are in the best interest of athletes' well-being. The benefits of aligning the funding model to incentivize athletes' well-being show potential to facilitate safe sport environments, extend athletes' careers, and prepare athletes for success beyond sport.

This research illustrated the roles and responsibility performance partners, support personnel, and athletes have in upholding the current culture of high-performance sport, specifically how the culture influences athletes' access to retirement resources. Given the significant influence all roles have in the system, performance partners and support personnel have a responsibility to reflect on and assess whether the policies, guidelines, metrics, and regulations they use expand beyond the best interest of athletes' performance and to consider an athletes' holistic well-being.

Data Restrictions

The data that support the findings of this study are available on request from the corresponding author, [IH]. The data are not publicly available due to containing information that could compromise the privacy of research participants.

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General Discussion

The purpose of this doctoral dissertation was to identify and address athlete retirement needs in the Canadian high-performance sport system. More specifically, the objectives were to (a) understand how HPAs were utilizing and accessing retirement support, (b) identify and assess sport members' understanding and perceived gaps regarding athlete retirement resources, and (c) facilitate a co-design session to co-create prototypes to address athlete retirement gaps within the sport system. The findings from this dissertation were presented in three articles. This section offers a broader contextualization of the novel research contributions made from this dissertation. In this section, the researcher following section discusses the research contributions related to misalignment, retirement research advancements, practical implications, as well as limitations and future directions.

Magnified Lens on Misalignment

The Canadian sport system is described in this research as a layered system that collectively aspires to advance the performance of Canadian athletes. Athletes, support personnel, and performance partners in this system shape and uphold the culture through their unique roles and responsibilities. When members of the sport system have differing values, priorities, and practices, misalignment within the sport system can occur.

The culture of high-performance sport has been shown to foster a single-minded focus on winning (Careless & Douglas, 2013). This singular focus is often accompanied by significant pressure to attain performance outcomes, which can, at times, compromise athletes' mental health (Poucher et al., 2023; Sauve et al., 2023) and levels of life satisfaction (Pawoko et al., 2019). These findings extend our understanding of the pitfalls of a heavily performance-driven sport environment for HPAs' quality of life into and after retirement (Sauvé et al., 2022). The primary focus of performance results is incentivized through funding support as both greatly

influence the priorities, practices, and behaviours of HPAs, support personnel, and performance partners. Through our investigation of differing voices in the sport system, performance culture was a common theme that emerged from the findings; overall, we found this uniquely affected HPAs, support personnel, and performance partners' understanding, perception, and experience with athlete retirement support mechanisms.

Specifically, this research demonstrated that performance-related pressures can dictate a sport organization's priorities, their onboarding process for support personnel, as well as the longevity and perceived security of HPAs' roster positions. The impact of this performance-driven culture extended beyond HPAs to support personnel and performance partners. Through our research, we found members in all roles understood the negative impact a heavily results-driven environment can have on an athlete's ability to prepare for retirement. Despite this acknowledgment, each participant expressed doubts regarding their ability to cause positive change within their respective sport culture.

In Article 2, the HPAs demonstrated their own interpretations of whether their sport environment enabled, restricted, or hindered their ability to prepare for retirement. These interpretations were made by observing how support personnel responded to their teammates, whether HPAs contacted and shared information amongst retired HPAs, and the nature of HPAs' departure from their respective sport organization. As a result, some HPAs received support and guidance from their support personnel through collaborative planning within a four-year period, while other HPAs were fearful their roster position would be in jeopardy if they sought out retirement support. Nevertheless, these HPAs were left to navigate their preparation efforts in isolation and secrecy. As a result, some HPAs concluded their career with deep feelings of sadness due to their poor preparation. These findings validate previous research underlining the

influential role sport members' have in complicating or facilitating HPAs' ability to prepare for retirement (Brassard et al., 2022). As well, Murdock and colleagues (2014) found that HPAs neglect retirement preparation due to a fear of being perceived as less committed to their athletic obligations. These findings are significant as it outlines the progress HPAs have made in their willingness to proactively prepare for life after sport (Coakley, 1983; 2006); however, urgent action is required from sport organizations to engage in and provide their support personnel with the tools, knowledge, and training to create healthier sport environments that enables and supports HPAs' ability to utilize forms of retirement support without fear of reprisal.

The pressure HPAs are under to adopt the singular-performance-driven focus was mostly modeled and encouraged by support personnel. Indeed, when HPAs attempted to adopt a sport-life balance, this was often threatened or shamed by actions from support personnel (Brassard et al., 2022). In turn, support personnel perceived pressures that made it difficult to learn about retirement support mechanisms, such as limited funding, informal onboarding practices, and a lack of general knowledge on the landscape of resources available to support HPAs. As a result, the findings from Article 2 demonstrated support personnel have minimal knowledge and are unprepared to facilitate and support HPAs' proactive retirement needs within performance-driven environments.

Moreover, support personnel expressed a substantial gap in their understanding and level of curiosity with respect to athlete retirement support. The personas in Article 2 showcased support personnel having limited to nonexistent levels of understanding of the athlete retirement resources available; despite this low level of knowledge, they appeared eager to change and learn more about retirement resources to better support and guide their athletes, but their curiosity to obtain adequate knowledge must be met with a level of professional formality on the part of

performance partners. Accordingly, the lack of knowledge disseminated to support personnel across the sport system can provide context as to why HPAs perceive their sport environment can hinder or restrict their preparations for retirement.

Furthermore, the personas from the performance partners in Article 2 and the findings from Article 3 illustrated the misalignment of athlete retirement prioritization across the sport system. For example, performance partners expressed concerns with NSOs' resource disparities because, as stated from a performance partner in Article 2, "some organizations are run by a full team with people who are paid salaries and given benefits, whereas others are run by two to three volunteers...." As a result of these disparities, some NSOs have the resources to prioritize athlete retirement while others are unable to, which could lead to HPAs being poorly positioned for their lives after sport. Performance partners acknowledged the plethora of benefits HPAs can gain from developing aspects of their lives beyond their athletic performance, yet the current infrastructure (i.e., Game Plan) is not optimally used. The above-noted misalignment between the various levels of the sport system is a result of available support and resources not being communicated to HPAs. This misalignment is evident by the contradicting messages members in the sport system receive from Sport Canada to value, support, and develop HPAs holistically (Sport Canada, 2023). However, sport members perceive their sport organizations are only evaluated and rewarded financially based on their athlete's performances.

Naturally, not-for-profit NSOs rely heavily on external forms of funding. The findings of Article 2 confirmed this notion as funding metrics and external funding structures appeared to significantly influence sport members' priorities. This notion of financial prioritization was further built on in Article 3 when sport members in both co-design groups identified that changing the funding model was imperative to advance HPAs' ability to prepare for life after

sport. This proposed notion was due to the influence funding has on sport organizations' priorities. As described in Article 3, changes to the funding model should account for and incentivize aspects related to HPAs' holistic wellness. Furthermore, this funding change could serve as a catalyst to expand the performance-driven culture of sport to include and prioritize the long-term holistic wellness of HPAs.

In an effort of expanding the performance-driven sports culture towards encompassing long-term HPAs' holistic wellness, one should note that there appears to be a lack of clear consensus on athletes' rights to prepare for their lives after sport. In environments where athletes' ability to prepare for life after sport is hindered or restricted, there are no consequences in place to protect the rights of athletes. Power disparities across sport systems with athletes, support personnel, and performance partners can leave athletes vulnerable and unprotected (Tuakli-Wosornu et al., 2021). As a result of power disparities, nonexistent policies or consequences, and recent cases of abuse, sport governing bodies, such as the International Olympic Committee, have embedded human rights principles in their mission statements to inform athletes of their rights to ensure athletes are protected from individuals and sport organizations who attempt to abuse their power (Tuakli-Wosornu et al., 2021). The lack of consensus outlining athletes' retirement rights, policies to enforce these practices across NSOs, and consequences to condone sport organizations that fail to comply continues to place athletes at risk of facing physiological, social, emotional, and psychological challenges extending to depression, loneliness, alcoholism, substance abuse, and attempts or death by suicide (Clemmet et al., 2012; Gouttebarga et al., 2017; Lavalley et al., 2000; Stambulova & Wylleman, 2014). It is a collective responsibility to facilitate sport environments that enable athletes to engage in proactive retirement measures to provide athletes with the opportunity and autonomy to learn

and acquire tools necessary to manage their inevitable retirement from sport. These aforementioned gaps outline the need for some form of oversight committee to ensure athletes' rights to retirement support is outlined, protected, and respected.

Athlete Retirement Research Advancements

Since the introduction of Taylor and Ogilvie's (1994) conceptual model of adaptation to retirement, many athlete retirement researchers have shifted to explore the causes of retirement; assess access to resources; identify social and tertiary factors, such as an athlete's ability to navigate challenges; and determine whether an athlete experienced a personal crisis. Understanding each of these elements has provided important insight for assessing how prepared an athlete was for their retirement (Taylor & Ogilvie, 1994).

Programs to prepare and support athletes for retirement initially revolved around preparing athletes for their life without sport; more recently, however, international and competitive leagues have shifted towards utilizing a 'whole person' retirement approach as this approach is shown to have a greater impact on athletes' retirement preparedness and experiences (Alfermann et al., 2004; Jewett et al., 2019; Kuttel et al., 2020). In line with these recent recommendations, HPAs in the Canadian high-performance sport system have access to Game Plan, a form of evidence-based retirement support. Game Plan uses a whole person approach by providing athletes with educational, community, career, skill development, and mental health support (Game Plan, 2023). Though carded ("card" refers to financial assistance from Sport Canada's Athlete Assistance Program) athletes are provided with free access to holistic retirement support, Game Plan's resources are underutilized due to athletes' perception of environmental factors that can enable, restrict, or hinder an athlete's ability to prepare for retirement (Brassard et al., 2022). Collectively, these studies have helped shape researchers'

understanding of HPAs' retirement needs by highlighting the proactive holistic forms of development and specific environmental conditions required to equip HPAs for their life after sport. The current study adds to the literature by moving beyond the perspective of athletes and extends to explore, understand, and address the congruent environmental barriers and the impact retired athletes, active athletes, support personnel, and performance partners have on athlete retirement.

Empirical Contributions

Empirical contributions of this dissertation are grounded in the collaborative efforts made with active HPAs, retired HPAs, support personnel, and performance partners. All parties collaborated and designed feasible prototypes to address current barriers to retirement preparation. Through this process, members engaged in collaborative exercises that catered to the needs of end-users and fostered organizational transformation through guided prototype designing. This research demonstrated the benefits of collaboration across a system where individuals hold various levels of power and insight. Through these collaborative efforts, all three research questions and objectives were achieved.

The main objective from Article 1 was to advance our understanding of how retirement resources were being utilized by HPAs in Canada. These findings were imperative to provide contextual meaning about how HPAs were accessing Game Plan's resources, the rate at which they were utilizing them, and the discrepancies of usage across sport organizations. Through this research, we discovered there are significant discrepancies in how Game Plan is utilized across the sport system. These discrepancies were reflected in the NSOs funding since HPAs from higher funded NSOs used more retirement support; HPAs in non-disabled sports had higher usage when compared to HPAs in para sports, and HPAs competing in summer sports had higher

usage than HPAs competing in winter sports. Moreover, there were very few one-time users of the Game Plan resources. The data highlighted that HPAs were more likely to use Game Plan's resources after an initial engagement. This stresses the importance of introducing HPAs to Game Plan during their initial integration into their sport organization, which will give them a longer period of time to engage with the numerous resources.

The main objective from Article 2 was to gain insights into the gaps and landscape of how retirement resources are perceived by members in the sport system. This investigation showcased different actors and voices within the sport system to illuminate the diverse understandings and perspectives of athlete retirement support mechanisms. Through this research, we learned about the cultural, educational, and financial gaps that make it difficult for HPAs to engage in proactive retirement preparation. This empirical contribution furthers our understanding of why some HPAs may not engage in pre-retirement planning, which presents implications for HPAs' well-being, sport-life balance, and career longevity.

Another contribution of this research is highlighted in the process and results of the two co-design sessions described in Article 3. The following three prototypes were co-designed to bolster the endeavours of HPAs, support personnel, and performance partners to improve HPAs' preparedness for life after sport: 1) a new funding model, 2) external collaboration, and 3) further coach education about athlete retirement. Members of the Canadian sport system collaboratively worked towards identifying athlete retirement needs and designing prototypes to address these needs.

The final empirical contribution resides in the unique, yet persistent barriers HPAs, support personnel, and performance partners encounter when trying to prioritize athlete retirement within a sport system that is driven and incentivized by results. To date, most of the

athlete retirement research has presented information on athlete retirement only from the perspective of HPAs, which suggests that HPAs must face retirement planning as a concern for HPAs to face on their own. From an empirical standpoint, the findings presented in Article 2 and Article 3 captured athlete retirement through the lens of an organizational concern. As a result, athlete retirement findings reflective of Canada's current sport system's needs and experiences were identified by our sample of participants. In Article 3, for example, HPAs, support personnel, and performance partners highlighted difficulties in prioritizing retirement within the current culture of sport. Sport members discussed feeling stressed, pressured, and unstable due to the adopted 'win at all costs' mindset (Careless & Douglas, 2013). To further illustrate the significant burden the current funding model and 'win-at-all-costs' sport culture has on HPAs' ability to engage in retirement preparation, end-users identified the need to change the current funding model as a key foundational factor to better prepare and support HPAs for their lives after sport. Moreover, funding model changes were identified as one of their co-designed solutions in both co-design sessions.

Methodological Contributions

Previous athlete retirement research used post-positivists stances that centered on the perspective and experiences of HPAs. In this novel dissertation research, the researcher used Bronfenbrenner's EST (1977; 1979) and Design Thinking (Hasso Plattner d.School, 2022) methodologies to collaboratively explore and address the organizational and cultural barriers Canadian HPAs face when attempting to access resources to prepare for life after sport. These methodologies helped the researcher gain insight and work with a diverse group of end-users within the sport system. Furthermore, these methodologies allowed the researcher to strengthen her understanding of sport members' emotions, experiences, and perceived gaps in athlete retirement support mechanisms through empathy interviews and co-design sessions. Through

these methodologies, new insights emerged offering noteworthy empirical evidence by identifying the specific cultural factors that poorly position HPAs to prepare for their life after sport, as well as the needed change to address those specific factors.

To note, Bronfenbrenner's EST (1977; 1979) theory consists of four layers; the micro, meso, exo, and macro systems. Participants from this dissertation only consisted of athletes, who rest at the core, and members in the micro and meso system. To further expand the methodological contributions to the literature and strengthen our understanding of athlete retirement gaps across the sport system, future researchers are encouraged to seek participation from members in the exo and macro system. Participation from these two external layers can further our understanding of retirement gaps and provide instrumental insight on how to strengthen prototypes.

The inclusion of HPAs, support personnel, and performance partners across the sport system allowed for diverse roles to collaborate and design prototypes that considered the needs, limitations, and unique experiences of all end-users. Notably, collaborating with diverse end-users positioned the researcher to empirically investigate how sport members work together to design a product to address athlete retirement needs. This study was the first known use of Design Thinking approaches to advance athlete retirement literature.

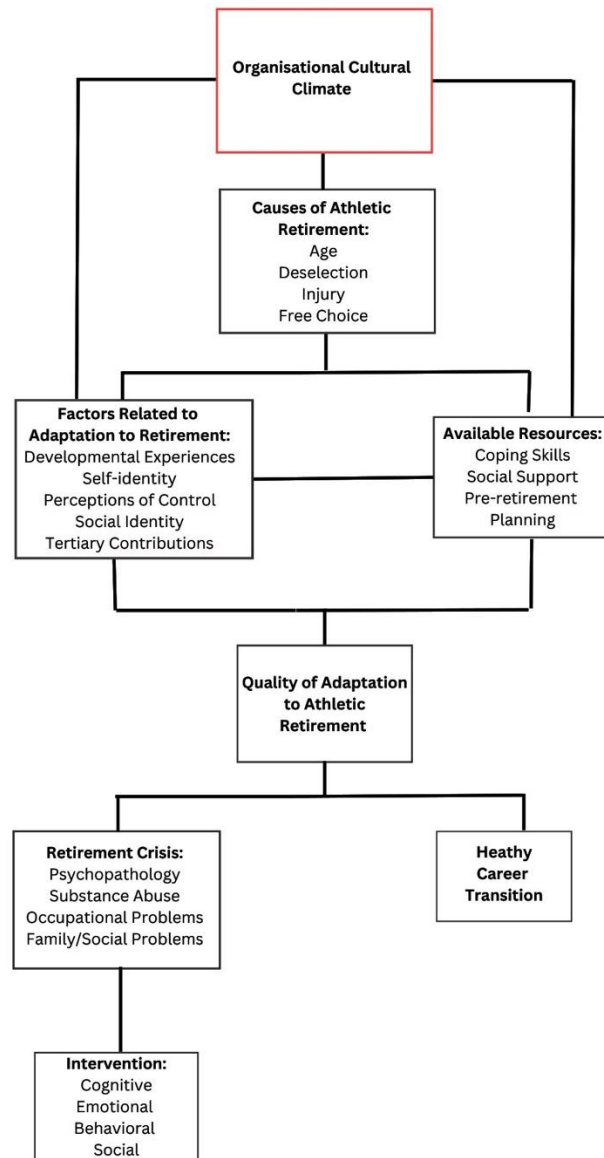
Theoretical Contributions

The relationship between the culture of high-performance sport and HPAs' retirement experience is not well explored in a theoretical sense. For instance, the athlete well-being (Sauve et al., 2023) and sport conforming pressures (Cokey-Cranney et al., 2012) literature suggested that both elements may influence HPAs' retirement preparation and experience. This dissertation has initiated the exploration of this relationship.

From a theoretical perspective, this research offers modifications to Taylor and Ogilvie's (1994) athlete retirement model. Through the exploration of sport members' interplay, this research demonstrates the influence that cultural high-performance sport environments can have in shaping an athlete's ability to prepare for life after sport and, as a result, shape an athlete's retirement experience. Taylor and Ogilvie (1994) identified the cause of an athlete's retirement as a primary factor to consider when one seeks to understand an athlete's retirement experience. The findings of this research suggest that the organizational cultural climate within which the athlete exists should be added as the *primary* consideration when seeking to understand an athlete's retirement experience.

Figure 6.

Modified Retirement Among Athletes Conceptual Model



Note: A modified version of Taylor and Ogilvie’s Retirement Among Athletes Conceptual Model (1994). This version includes the element ‘organizational culture climate’ as a significant component to consider when seeking to understand athlete retirement.

Whether an athlete retires due to injury, de-selection, or their own desire, the influence of sport’s organizational culture vis à vis their planning and preparation for life after sport has shown to influence an athlete’s transition out of sport. Therefore, sport organizations that consider their athletes as whole people who need a sport-life balance are well positioned to

prepare athletes for their retirement. As such, this factor emphasizes the need to preface organizational cultural climate in Taylor and Ogilvie's (1994) conceptual model for athlete retirement. Accordingly, this modification allows for a holistic exploration of the athlete retirement process, which will lead to a fully developed examination of the interplay between the involved stakeholders (i.e., active athletes, retired athletes, support personnel, and performance partners) and the various elements in the model. Athlete retirement is believed to be an organizational responsibility (Miller & Buttell, 2018; Singer, 2005). Adding the organizational cultural factor alleviates athletes from independently managing their retirement preparation and distributes the responsibility across the sport system.

Furthermore, theoretical findings from our research highlight the need to clarify what exactly are "available resources." According to Taylor and Ogilvie's model (1994), available resources allow athletes to seek coping skills, social support, or pre-retirement planning, all of which can influence their retirement experiences. However, our research showcases that this vague definition of "available" resources discredits the accessibility challenges athletes encounter when seeking to utilize retirement support mechanisms. For instance, carded HPAs in the Canadian sport system are presented with "available" resources to prepare and support their retirement (Game Plan, 2023); nevertheless, athletes' ability to utilize these resources have been shown to be restricted or hindered due to the organizational cultural and environmental barriers existent in their sport (Brassard et al., 2022). Thus, it is necessary to clarify that existence (i.e., "available") is not synonymous with accessible. This finding further emphasizes the importance of considering the sport organizational cultural environment as a primary factor to consider when seeking to understand athletes' retirement experiences; this insight can illuminate athletes'

preparedness for retirement by considering the proactive and reactive resources available and accessible to athletes.

Research investigating the relationship between high-performance sport culture and an HPA's experience is necessary to advance our understanding of the organizational impact to further conceptualize what changes, if any, need to be made to support an HPA's proactive and reactive retirement needs. Given the increasing evidence of the current barriers an HPA faces in accessing retirement support, further collaborative, solution-driven research is strongly encouraged to enhance overall athlete well-being.

Practical Implications

Given the novel findings of this research, the researcher will offer her reflections on practical implications. As previously noted, scholars have highlighted the importance of sport organizations sharing the responsibility to prepare HPAs for retirement (Miller & Buttell, 2018; Singer, 2005). These research findings offer decision-making implications, as well as tangible implications for sport members. Both forms of implications presented in this section are aligned with fostering and propelling sport environments to increase athletes' knowledge of and accessibility to retirement support.

The current research demonstrates the alignment required from support personnel and performance partners to intentionally foster environments where athletes feel encouraged and safe to prepare for life after sport. This, in turn, could motivate support personnel to stay informed and make whole person decisions that positively influence sport environments. For example, support personnel can encourage and celebrate athletes who seek external commitments outside of their sport. Support personnel should familiarize themselves with Game Plan's resources and work closely with Game Plan advisors to collaborate on group information

sessions to ensure all members of sport organizations are well informed on how to foster and uphold sport environments that enable retirement preparation. In reviewing Game Plan's data, we learned most athletes who engaged with Game Plan's resources once ultimately continued their engagement with Game Plan. Support personnel who facilitate athletes' engagement with Game Plan can be catalysts in prompting a sport-life balance by expanding the sole focus from performance results to holistic development. Research has shown that athletes who engage in a sport-life balance experience higher levels of satisfaction (Pawoko et al., 2019). This link is significant as dissatisfaction has been shown to negatively influence athletes' mental health (Walton et al., 2021), well-being (Chen & Kee, 2008), burn out risk (Lopes & Vallerand, 2020), and performance (Burns et al., 2022); all of which can contribute to an athletes' retirement experience.

Furthermore, the findings in Article 2 and Article 3 disclosed the experiences of athletes both yearning for and benefiting from connecting with retired athletes prior to retiring. Also, athletes that re-engaged with their NSO once they had retired benefited from further professional development, mentorship, networking, and socialization. Though the cause-and-effect relationship of social support between active and retired athletes is not definitive, research has shown that informal use of social support can help athletes transition out of sport (Brown et al., 2018; Harrison & Lawrence, 2003; 2004; Taylor & Ogilvie, 1994; Willard & Lavalley, 2016). As such, NSOs should find ways to connect and engage retired athletes with current athletes. Such engagements could include developing professionally (i.e., coaching or refereeing), mentoring a player, networking opportunities, or socializing at events.

The three prototypes designed by end-users in this research require strong alignment across members in the sport system: 1) a new funding model, 2) external collaboration, and 3)

further coach education about athlete retirement. Performance partners are encouraged to reflect on the 'win-at-all-cost' culture that is portrayed through the sport system and reinforced by the current funding model. As for not-for-profit sport organizations, the structure deciding how organizations are evaluated for funding has significant influence in impacting the well-being and safety of athletes (Arnold et al., 2019; Hernandex et al., 2018). An influence of this magnitude should be met with responsibility and accountability. Gaps identified by sport members during the co-design sessions in Article 3 imply the current funding model is inadequately supporting the holistic development of athletes. As such, implications to change this model to better prioritize athletes' wellness and retirement is recommended.

Performance partners and support personnel are encouraged to collaborate and establish best practices to ensure sport members receive adequate knowledge and remain updated on the athlete retirement support mechanisms. This can occur through formalized collaboration efforts between NSOs and Game Plan, as well as through reoccurring athlete retirement information sessions for support personnel. This implication can provide support members with the tools, skills, and relationships required to foster enabling environments for athletes to prepare for life after sport.

Limitations and Future Directions

The findings from this dissertation advance athlete retirement literature through the unique methodological, empirical, theoretical contributions, and practical implications. Notwithstanding these contributions, some limitations must be acknowledged to guide the future direction of research. First, the Canadian sport system is home to 95 sports competing in international competition (Team Canada, 2023). A total of 34 sport members from the following 12 organizations participated in this study: Basketball (i.e., wheelchair and standing), Canadian

Olympic Association, Canadian Paralympic Association, Canoe & Kayak (i.e., para), Freestyle Ski, Game Plan, Judo, Own the Podium, Rowing (i.e., para and non-para), Swimming (i.e., para and non-para), and volleyball. As such, the results reflect only a portion of the whole sport system. Future research is needed to include the voices of specific roles that were missed such as high-performance directors who hold a unique role in the ecological system of sport that is in between support personnel and performance partners. Furthermore, variables such as gender expression were not captured in this study. Future research is needed to understand 2SLGBTQIA+ athletes and their lived experiences with athlete retirement as there is limited research in this area (Mattson, 2018; McNary, 2021).

Second, member reflection is a tool best used to “invite external dialogue surrounding: fairness, appropriateness and believability of interpretations being offered” (Burke, 2017, p. 344; Rolls & Relf, 2006). Though considered beyond the scope of this project, allowing an opportunity for member reflections during the construction of the personas could have enhanced the quality of interpretations used to construct the personas.

The third limitation that should be noted is the facilitation of the co-design sessions. The initial plan for the co-design sessions was to be held in person. However, due to stay-at-home orders issued because of COVID-19, the researcher was forced to move the co-design sessions to the virtual platform Zoom. This change presented some challenges with participants facing technology difficulties, remaining online, and encountering challenges signing onto the Mural platform where participants pasted their sticky notes. The shift to virtual sessions has been noted to present challenges in people’s ability to focus, connect with others, and influence people’s willingness to contribute to discussions (Kohnke & Moorhouse, 2020), all of which were

observed in this research. As a result, researchers are encouraged to facilitate co-design sessions in-person, when possible, to allow for more organic forms of connection and discussion.

The fourth and final limitation worthy of note is the lack of participation from the exo and macro layers of Bronfenbrenner's EST (EST; 1977; 1979). Sport members within the exo layer are immersed in the Canadian High-Performance Sport Strategy framework that upholds the cultural climate of high-performance sport in Canada (Canadian High-Performance Sport Strategy, 2019). Members within the marco layer are immersed in the policies and guidelines that support Canadian athletes' eligibility to compete on the international stage. Future research is encouraged to seek participation from both the exo and macro layers as their insight has potential to enhance our understanding of athlete retirement from a broader lens.

Finally, future recommendations for the research include implementing and evaluating the three design prototypes: (a) a new funding model, (b) external collaboration, and (c) further coach education about athlete retirement. Design Thinking is an iterative process; therefore, implementing and evaluating these prototypes may provide rich insights into confirming the findings from previous phases or identifying phases that should be revisited.

Conclusions

While some advances have been made regarding athlete advocacy, high-performance sport uniquely positions athletes to be the focal point of the sport system as they have limited influence on the rules, practices, culture, and guidelines. This position can leave athletes vulnerable. Accordingly, their needs and best interests may be neglected should those with power not deem specific elements, such as athlete retirement, a priority. The current state of the Canadian sport system poses distinctive challenges to HPAs' ability to maintain a healthy sport-life balance and to prepare for life after sport. Though Canadian HPAs are eligible to receive free

proactive and reactive retirement support, performance partners and support personnel have the power to foster environments that either restrict, hinder, or enable HPAs' ability to engage with these resources (Brassard et al., 2022). The presented research adds to the literature by documenting instances where HPAs feared being penalized for wishing to better prepare themselves for their life after sport.

The three articles presented in this study advance the athlete retirement literature by working with sport members to showcase how Canadian HPAs utilize athlete retirement support mechanisms, to demonstrate sport members' understanding and perceived gaps of the support mechanisms, and to contribute three needs-based athlete retirement prototypes. Collectively, the three articles make empirical, theoretical, and methodological contributions, as well as provide practical implications for the Canadian sport system. Furthermore, this research lays the groundwork for future work to better support HPAs as they move through their retirement phase. The dissertation makes concrete suggestions for improving athletes' abilities to prepare for life after sport, identifies further areas of consideration within the field of athlete retirement, and advances current empirical models within the field of athlete retirement. In the end, through change and consideration of the organizational context, the researchers hope sport organizations will consider the designed prototypes to help adjust their culture to better support their athletes' long-term well-being and transition out of sport.

Statement of Contribution

I, Iman Hasan, was responsible for collecting and analyzing the data in all three phases of this research. Three resulting articles were written from this research; all of which I lead in authorship. Dr. Diane M. Culver, the supervisor, was directly involved in every aspect of this research project that started in September 2019 and concluded in August 2023. Over the last four years, Dr. Culver contributed to designing the project, offering guidance, and supporting through the data collection, analysis process, and the article construction. Furthermore, Dr. Culver's efforts extended to provide constructive feedback and revisions for the entire dissertation. Contribution efforts were made from my thesis supervisory committee members, Natallie Durand-Bush and Kyle Paquette. Both provided conceptual feedback at the proposal stage of the research and offered guidance and support during the data collection. Finally, a contribution to Article 1 was made by Dr. Casandra Seguin. As mental performance consultant and a researcher, Dr. Cassandra Seguin contributed to the first article through writing and revisions, and she provided critical feedback as well. Ethics approval for the research project was obtained from the Research Ethics Board of the Office of Research Ethics and Integrity at the University of Ottawa.

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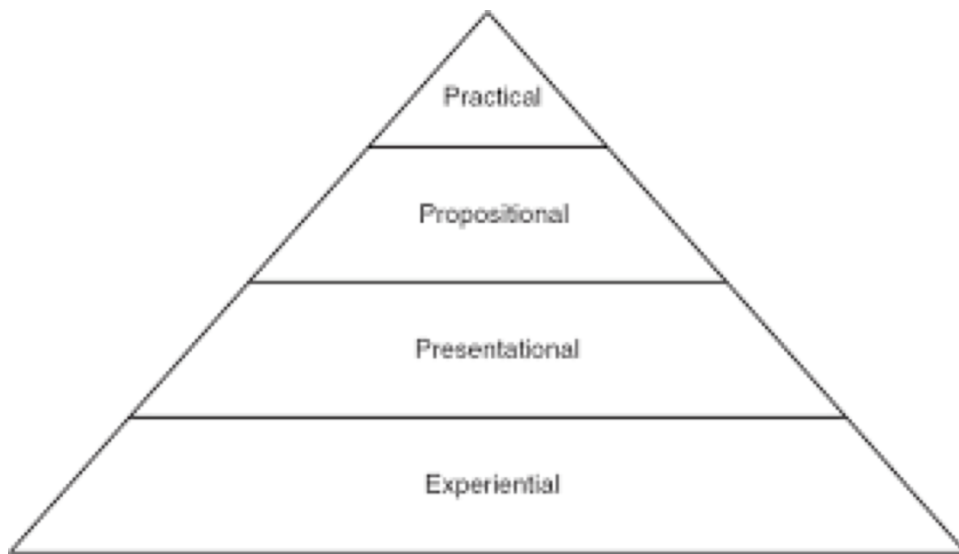
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Appendix A: National Sport Organizations in Canada

Alpine Skiing	Archery	Artistic Swimming	Athletics	Badminton	Baseball
Basketball	Beach Volleyball	Biathlon	Bobsleigh	Boxing	Canoe/Kayak-Slalom
Canoe/Kayak-Spring	Cross-Country Skiing	Curling	Cycling – BMX	Cycling-Mountain Bike	Cycling – Road
Cycling – Track	Diving	Equestrian - Dressage	Equestrian-Eventing	Equestrian-Jumping	Fencing
Field Hockey	Figure Skating	Football (Soccer)	Freestyle Skiing	Gold	Gymnastics-Artistic
Gymnastics – Rhythmic	Gymnastics – Trampoline	Handball	Ice Hockey	Judo	Karate
Luge	Modern Pentathlon	Nordic Combined	Rowing	Rugby	Sailing
Shooting	Skateboarding	Skeleton	Ski Jumping	Snowboard	Softball
Speed Skating – Long Track	Speed Skating – Short Track	Sport Climbing	Surfing	Swimming	Table Tennis
Taekwondo	Tennis	Triathlon	Volleyball	Water Polo	Weightlifting
Wrestling	Para Ice Hockey	Para Snowboard	Wheelchair Curling	Para Nordic Skiing	Para Alpine
Para Canoe	Wheelchair Basketball	Para Cycling	Wheelchair Fencing	Para Taekwondo	Wheelchair Rugby
Para Triathlon	Wheelchair Tennis	Para Athletics	Para Powerlifting	Para Archery	Para Rowing
Para Badminton	Shooting Para Sport	Boccia	Sitting Volleyball	Para Equestrian	Football 5-A-Side
Goalball	Para Swimming	Para Judo	Para Table Tennis		

Notes: This list consists of the Canadian National Sport Organizations as shown on the Olympic and Paralympic websites (Canada Olympic, 2021; Canada Paralympic, 2021). These sports enable athletes and para-athletes the opportunity to represent Canada and compete on the international stage. A representative sample of athletes, support personnel, and performance partners were sought out from these sports.

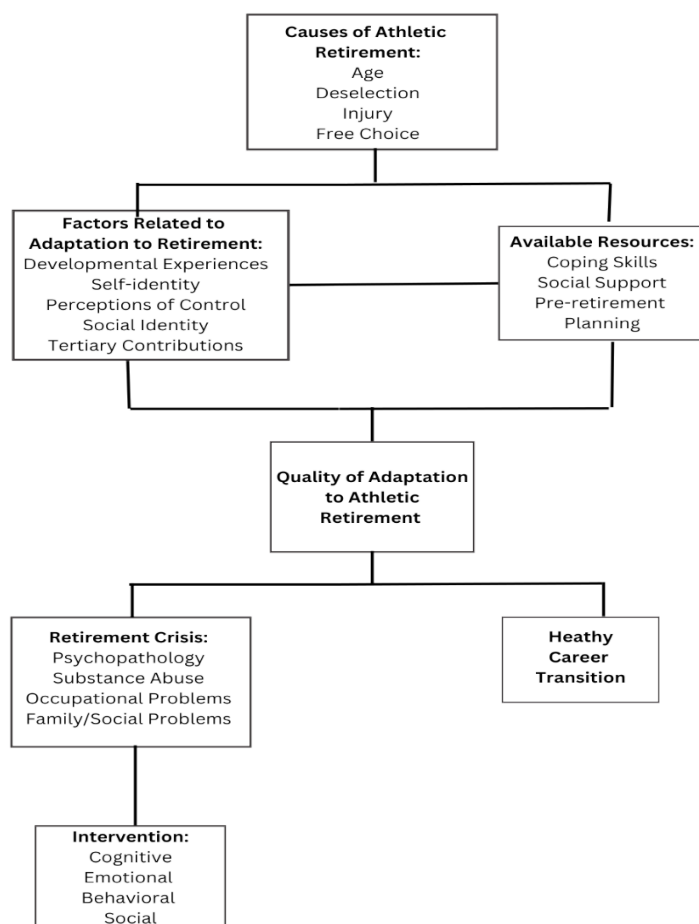
Appendix B: Four Ways of Knowing Diagram



Notes: This diagram illustrates the interrelated ways of knowing throughout the research process from Heron and Reason (2008).

Appendix C: Conceptual Model of Adaptation to Retirement Conceptualization

RETIREMENT AMONG ATHLETES



Notes: This model was produced by Taylor and Ogilvie (1994) to illustrate the experience athletes endure during their retirement from sport.

Appendix D: Participant Recruitment Text

Iman Hassan, MKH
 Doctoral Candidate
 Faculty of Health Sciences
 School of Human Kinetics
 University of Ottawa

Diane M. Culver, PhD
 Associate Professor
 Faculty of Health Sciences
 School of Human Kinetics
 University of Ottawa

Hello (insert **active or retire athlete's** name)

My name is Iman Hassan, and I am a doctoral candidate at the University of Ottawa in the School of Human Kinetics, working under the supervision of Dr. Diane Culver. I am reaching out today to invite you to participate in a study that is seeking to understand the retirement preparation resources provided to high-performance Canadian athletes. The goal of this research is to explore the resources or lack of, that are in place to proactively prepare athletes for their lives after sport. The researcher seeks to learn about your perspective of the resources that prepare Canadian high-performance athletes for their athletic retirement. Additionally, the researcher will facilitate a co-design session for members to exchange knowledge and work collectively to design proactive retirement prototypes to enhance Canadian athletes' ability to prepare for retirement.

If you are willing to participate, your role as a participant will include engaging in *one* individual interview or *one* group co-design session. Due to COVID-19 health restrictions, every gathering will be held virtually on Zoom. The interviews and group gatherings will be facilitated by the primary researcher, Iman Hassan. The goal of the individual interviews is to explore your athletic journey including the resources that you may feel have contributed to your preparedness or lack of, for your eventual retirement. The co-design session will include NSO category 1 active and retired high-performance athletes, coaches, mental performance consultants, mental health practitioner, athletic trainers, high-performance directors, and representatives from Game Plan, On the Podium Staff, Canadian Coaches Association, and the Canadian Olympic Committee. This co-design session will integrate individuals from different ecological levels of sport and collaboratively engage in dialogue anchored in improving the retirement experience for high-performance athletes. Activities in these meetings will consist of; interviews, reflective activities, and discussions.

The data collected in this study will be kept anonymous and will only be used for the outlined purpose of the study.

Your participation in this study will support the research endeavors for the researchers and contribute to the field of sport performance psychology, more specifically to athlete retirement practices for Canadian high-performance athletes. If you are interested in participating in this study, please contact me at your earliest convenience so that we can further discuss more information and address any questions that you may have.

Thank you for your time and consideration.

Iman Hassan

Iman Hassan, MKH
 Doctoral Candidate
 Faculty of Health Sciences
 School of Human Kinetics
 University of Ottawa

Diane M. Culver, PhD
 Associate Professor
 Faculty of Health Sciences
 School of Human Kinetics
 University of Ottawa

Hello (insert **support personnel or performance partner's** name)

My name is Iman Hassan, and I am a doctoral candidate at the University of Ottawa in the School of Human Kinetics, working under the supervision of Dr. Diane Culver. I am reaching out today to invite you to participate in a study that is seeking to understand the retirement preparation resources provided to high-performance Canadian athletes. The goal of this research is to explore the resources or lack of, that are in place to proactively prepare athletes for their lives after sport. The researcher seeks to learn about your perspective of the resources that prepare Canadian high-performance athletes for their athletic retirement. Additionally, the researcher will facilitate a co-design session for members to exchange knowledge and work collectively to design proactive retirement prototypes to enhance Canadian athletes' ability to prepare for retirement.

If you are willing to participate, your role as a participant will include engaging in *one* individual interview or *one* group co-design session. Due to COVID-19 health restrictions, every gathering will be held virtually on Zoom. The interviews and group gatherings will be facilitated by the primary researcher, Iman Hassan. The goal of the individual interviews is to explore your journey in the sport system including the resources that you may feel have contributed to athletes' preparedness or lack of, retirement. The co-design session will include NSO category 1 active and retired high-performance athletes, coaches, mental performance consultants, mental health practitioner, athletic trainers, high-performance directors, and representatives from Game Plan, On the Podium Staff, Canadian Coaches Association, and the Canadian Olympic Committee. This co-design session will integrate individuals from different ecological levels of sport and collaboratively engage in dialogue anchored in improving the retirement experience for high-performance athletes. Activities in these meetings will consist of; interviews, reflective activities, and discussions.

The data collected in this study will be kept anonymous and will only be used for the outlined purpose of the study.

Your participation in this study will support the research endeavors for the researchers and contribute to the field of sport performance psychology, more specifically to athlete retirement practices for Canadian high-performance athletes. If you are interested in participating in this study, please contact me at your earliest convenience so that we can further discuss more information and address any questions that you may have.

Thank you for your time and consideration.

Iman Hassan

Appendix E: Consent Form

Iman Hassan, MKH
 Doctoral Candidate
 Faculty of Health Sciences
 School of Human Kinetics
 University of Ottawa

Diane M. Culver, PhD
 Associate Professor
 Faculty of Health Sciences
 School of Human Kinetics
 University of Ottawa

Invitation to Participate: You have been invited to participate in a study conducted by Iman Hassan, who is a Ph.D. Candidate researcher at the University of Ottawa is working under the supervision of Dr. Diane Culver. The **purpose of this study** is to co-create, disseminate, and assess an approach to support Canadian high-performance athletes for their transition out of sport.

Your **participation** in this study will consists of up to *one* individual interview or *one* co-design session. In the co-design session, activities, such as but not exclusive to; interviews, surveys, self-reports will take place. The co-design session will consist of NSO category 1 active and retired high-performance athletes, coaches, mental performance consultants, mental health practitioners, athletic trainers, high-performance directors, and representatives from Game Plan, On the Podium Staff, Canadian Coaches Association, and the Canadian Olympic Committee. The interviews and co-design session will be conducted on a virtual platform, Zoom that will be audio and visually recorded. You will have access to the group recordings and transcribed materials from your interview. Interviews will occur at an agreed-upon time that is convenient for all parties.

Assessment of risks: My participation in this study entails very limited foreseeable risks. However, if I experience any discomfort, Iman Hassan has assured me that she will make every effort to minimize to discomfort. I may decide to stop my participation at any time without consequence.

Benefits: Athletic retirement has been shown to act as a catalyst for emotional challenges for athletes who fail to receive proactive retirement training. This research aims to explore and collaboratively create an approach to proactively prepare and reactively support athletes through their inevitable transition out of Canadian high-performance sport. The information collected in this study may be disseminated to impact a wider range of athletes who can benefit from proactive athletic retirement resources. As a participant, you will be contributing to the field of sport performance psychology, athlete development, with a specific focus on athlete retirement.

Privacy of participants: I have received the assurance from Iman Hassan, that the information I share during the activities (i.e., interviews) will remain strictly confidential. Participants will be asked to maintain confidentiality during activities; however, anonymity is not possible between participants in the Community of Practice. The content from these discussions will be used for the completion of this project and other publications for dissemination. I understand that through

each phase of dissemination, anonymity will be granted for all participants. I understand that the information discussed during these meetings is to remain confidential.

Confidentiality and conservation of data: I have been assured that the interview recordings and transcripts will be kept securely in the researcher's office during the research. In five years, all materials data will be shredded, and electronic data will be erased.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, the researchers will do their best to remove and destroy all data gathered from me until the time of my withdrawal. I understand that in the context of audio-recorded group activities, it may be difficult to isolate and remove all of my contributions, but I have been ensured by Iman Hassan that her best attempt will be made.

Acceptance: I, _____ *[full name of participant]* agree to participate in the above evaluation conducted by Iman Hassan, in the School of Human Kinetics, at the University of Ottawa.

If I have any questions about the study, I may contact Diane M. Culver.

If I have any questions regarding the ethical conduct of this study, I may contact the Office of Research Ethics and Integrity, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, On K1N 6N5.

Tel: (613) 562-5387

Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

If I have any questions regarding the ethical conduct of this study, I may contact the Office of Research Ethics and Integrity, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, On K1N 6N5.

Tel: (613) 562-5387

Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

Participant's name / Pronouns

Date:

Signature:

Researcher's name / Pronouns

Date

Signature:

Appendix F: Empathy Interview Guide

1. What is your official title?
2. What does your role as *[insert title]* consist of?
3. How long have you been in this role?
4. Have you held previous relevant roles to the role you currently hold?
 - a. If yes, what were they?
5. Tell me about your experience as an athlete, if applicable?
 - a. If applicable, what sport did you play?
 - b. If yes, what was the highest level of competition you competed in?
 - c. If yes, can you explain your experience transitioning out of the athlete role.
 - d. If yes, do you recall engaging in any preparation for retirement prior to transitioning?
6. Do you have any relations with individual who have recently transitioned out of high-performance sport?
 - a. If yes, how would you describe their experience?
 - b. If yes, has their experience led to any lessons for you?
7. Are there any specific skills or experiences from sport that you believe could help athletes during their transition out of sport?
8. What social challenges do you presume athletes encounter during their transition out of sport?
9. What mental challenges do you presume athletes encounter during their transition out of sport?
10. What physical challenges do you presume athletes encounter during their transition out of sport?
11. Are you aware of any accessible resources that are in place to prepare or support athletes during their transition out of sport?
 - a. If yes, can you describe accessibility opportunities and barriers to the transition resources?
 - b. Do you have any suggestions as to how such resources could become more accessible to athletes?
12. Game plan is a program collaborated through the Canadian Olympic Committee, Canadian Paralympic Committee, Sport Canada and Canadian Olympic, and Paralympic Sport Institute Network that aims to provide carded athletes with the resources to improve their life-sport balance, post-career planning, and sport performance optimization. Are you familiar with their resources?
 - a. Can you describe what you know about Game Plan's resources?
 - b. Have you ever recommended or discussed these resources with/to an athlete?
 - c. If yes, can you reflect on this experience?
 - d. If applicable, how would you evaluate the effectiveness of Game Plan's resources in preparing and supporting athlete through their transition out of sport?
13. The LTAD is an 8- phase model that acts as a guiding source for athletes, coaches, stakeholders and members in the sport community. The phases consist of *1) awareness*

and first involvement, 2) active start, 3) FUNdamentals, 4) learn to train, 5) train to train, 6) train to compete, 7) train to win and, 8) active for life). This model addresses sport performance and human development to guide athletes from their very first introduction to sport, to reaching the podium, and then concluding with preparing athletes to be active for the remainder of their lives. Are you familiar with this model?

- a. If yes, can you recall specific occasions when you have referred to this model?
 - b. If yes, are you aware of any resources, within this model, created to prepare and/or support athletes for their enviable transition out of sport?
14. What additional resources would you recommend preparing athletes for their transition, and at what phase do you think it would be most beneficial to happen any why?
 15. Out of all the support personnel and stakeholders with whom high-performance athletes interact, who do you think is in the best position to provide proactive transition resources/support?
 16. Can you describe if and to what extent you believe organizations are responsible to either prepare or support athletes for their retirement?

Appendix G: Personas

Active
Athlete
1



- Earned carding after graduating from university
- Earned an Olympic medal during their first games, though it is likely for athletes in their sport to improve after 2nd / 3rd games
- Will likely retire after Paris '24, due to financial and familial goals - specifically wishes she had access to IVF information/support
- Perceives athletes are discouraged to pursue external commitments (ex., school, work, parenting) within NSO due to observing athlete's being shamed for engaging in such acts.

Active
Athlete
2



- Paralympian who acquired their disability in their late teens, and then joined sport shortly after.
- Actively engaged with their local disability community within their university
- Despite environment being supportive of external engagements (school), the athlete dropped out to focus on their athletic career
- Since dropping out, they started experience mental health challenges
- the athlete has sought help from Game Plan , but felt they were unhelpful due to limited understanding of their disability

Active
Athlete
3



- Has been a carded athlete for 6 years
- Has earned their Bachelor's degree, though they will likely need to further their studies to utilize it.
- Unsure of any available resources to support retirement. *"Retirement will be very scary - I don't even like thinking about it."*
- Doesn't recall retirement/ sport life balance ever being discussed within sport environment
- Hesitant to explore resources due to consistent uncertainty within team as various athletes are selected for various competitions.

Retired
Athlete
1



- Retired after the Tokyo Games
- Despite knowing they were going to retire, the athlete felt as if sharing this news with their NSO could jeopardize their spot at the Games, and therefore informed their NSO of their retirement after the games.
- Familiar with retirement resources, however, their NSO actively discouraged athletes to engage in external commitments even when they were funded through carding. These were viewed as 'distractions' that could cost you your roster spot.
- Utilized mental health resources as an athlete and has been on a 7-month waiting list to continue support since retiring.
- Secretly struggling with substance abuse due to sport withdrawal
- Memory of sport is a 'lingering disappointment' due to feeling 'completely disposable and exploited'.

Retired
Athlete
2



- Retired after earning a medal at Tokyo Games
- Began preparing for retirement after Rio '16 games by saving and purchasing a home, communicating retired peers, and by exploring business pursuits.
- Was transparent with NSO about retirement plans due to collaborative quad planning. Despite transparency, they felt as though members in the NSO had little to no knowledge on accessible support
- They spent a lot of time (trial and error) in locating proactive and reactive retirement support. Found some things that would have been helpful had they engaged years prior.
- They are now fully transitioned out of sport, working full-time, and utilizing postcarding benefits (health insurance & financial advisors).

Support
Personnel
1



- 4th year as a coach for the national team
- actively encourages athletes to pursue external commitments - Believes that their athletes' are healthier and perform better when they engage in various external commitments
- Upon being hired, the process was rushed due to the urgency of filling their role. They still feel as though they lack knowledge of the resources available to support athletes
- Shared that they became motivated to explore resources following their interview with Iman.
- Athletes within their sport tend to perform best during their 2nd/3rd games, therefore ensuring they have a sustainable balanced life throughout those years is a part of their coaching philosophy, despite lacking knowledge on how to directionally guide the athletes to external support.

Support
Personnel
2



- 5th year as a full-time support personnel (IST)
- When they were hired, the onboarding process was informal, they still do not have a good understanding of carding, and available resources
- Feels as though athletes tend to participate in their sport for several years and is unsure of whether retirement is a challenge. If it ever becomes one, they are confident that their NSO will address it.
- Has a low-moderate level of understanding of the resources available to support athletes' mental health, well-being, and extracurricular pursuits.
- Has limited confidence endorsing programs such as Game Plan, due to their limited knowledge of the organization
- Perceives athletes are hesitant to discuss retirement due to fear of being perceived as 'distracted'.

Performance
Partner
1



- perceives that athletes are neglected and feel undervalued due to Canada's prioritization and focus on medals
- Believe that pressure is felt by IST, who then are unable to prioritize exploring external resources that can contribute to sport-life balance.
- Believes that this neglect isn't intentional, but rather is a result of limited capacity. However, without changes to funding structures, the severe pressures will make it difficult for athletes' to receive support for a sport-life balance (proactive and reactive retirement support).
- Exceptions are made to organizations that are well funded which then separates sports into the haves and have-nots.
- Well-funded organizations (typically high-performing) tend to have the capacity to invest in intentional practices to promote sport-life balance and retirement support.

Performance
Partner
2

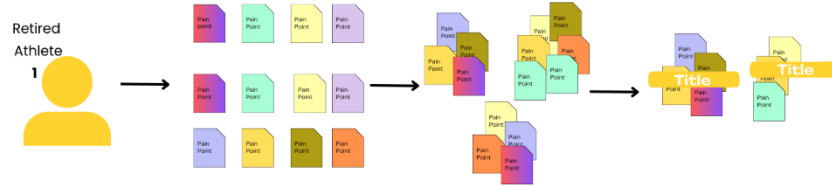


- Game Plan has made significant changes in its approach to better reach the targeted audience (athletes)
- Coaches, support staff, and culture within NSOs play a significant role in whether athletes engage in sport-life balance practices, or seek proactive and reactive retirement support.
- Efforts are now being made to promote wellness, sport life balance, and the connection of such to performance and well-being.
- Reoccurring trend of coaches, support staff, and athletes having limited to no knowledge of resources available.
- New focus on educating sport system of their resources available to promote higher engagement

Appendix H: Co-design Session Outline

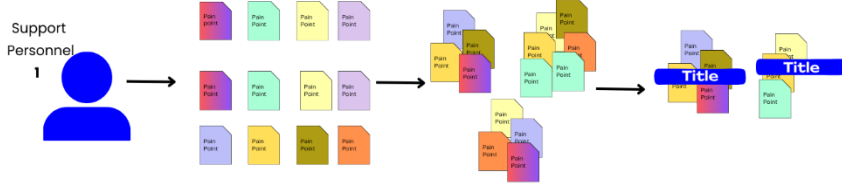
Pg. 3

Retired Athlete Persona – Breakout Rooms Cluster Brainstorming: Review the retired athletes personas. Identify the pain points you observe as it relates to transitioning out of sport with your assigned breakout room.



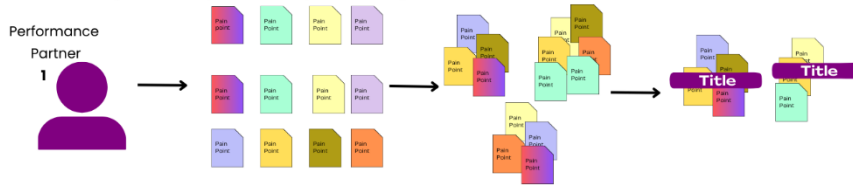
Pg. 4

Support Personnel Persona – Breakout Rooms Cluster Brainstorming: Review the support personnel personas. Identify the pain points you observe as it relates to transitioning out of sport with your assigned breakout room.



Pg. 5

Retired Athlete Persona – Breakout Rooms Cluster Brainstorming: Review the performance partner personas. Identify the pain points you observe as it relates to transitioning out of sport with your assigned breakout room.



Pg. 6

Cluster Organization: Bring together all of the finalized cluster titles from each persona and assess whether any titles can be clustered together.



Pg. 7

How Might We (HMW)- Curate 'how might we' questions that are reflective of the final title clusters. For example, if athletes' access to food is one title cluster, the 'how might we' question can be 'how might we improve access to food for athletes?'



Pg. 8

How Might We Ideate- Brainstorm actionable prototypes (PR) to address the curated 'how might we' question. Engage with cluster brainstorming steps to narrow down to top two prototypes



Pg. 9.

Prototype Selection- Given the knowledge you've gained from this session and your experience, use a dot to indicate the two most feasible, practical, and viable prototypes.



Pg. 10

Indicators, Risks, and Opportunities for Success: Identify the indicators using yellow sticky notes, risks using red sticky notes, and opportunities for success using green sticky notes for each prototype.

